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No. 1

Pruning the Apple Orchard

G. S. RALSTON, Associate Horticulturist, Virginia

Pruning is universally recognized by orchard men as one of the important factors connected with successful fruit production. The modern grower first practices it in training the young tree to a shape or form which approaches more or less closely his ideal of a perfect type. This result attained, he changes from formative to productive pruning, or from the practices utilized to shape the tree to those which promote fruit production. From the age of production his system of pruning should be such as will tend to maintain a proper balance between vigor and maximum productivity, in so far as they are influenced by pruning, and at the same time maintain tree symmetry and strength, and promote convenience in all other orchard operations.

There is a wealth of literature dealing with orchard pruning. The majority is simply a concensus of opinions or theories. A minor portion is based upon tabulated results of well-organized investigational work. Fortunately, a goodly number of prominent horticultural investigators recognized the need of investigational pruning, and the fruits of their labor are beginning to appear. Perhaps interesting light will appear on such factors as influence of time of pruning upon fruit production and regularity of production, the influence of both winter and summer pruning on above factors, the different results obtained by summer and winter pruning, the amount of pruning an annual-bearing variety will bear as compared to biennial-fruited varieties, the amount of shade under which fruit buds will form, and many other factors which, when fully investigated and the conditions under which they are applicable fully known, will give a broader and more intelligent foundation upon which pruning practices can be based in order to secure the maximum yield of choice fruit.

Plant Food Needed

However, the grower should not expect too much from pruning alone. Satisfactory results can only be realized, even with careful pruning, when the tree receives sufficient plant food at the right time to form strong fruit.

The writer realizes that it is almost impossible to advocate any pruning practices that are new or about which there are not contrary views. Most of them have been widely discussed. However, with this fact in mind, an attempt will be made, from information at hand, to suggest pruning practices and the results we hope to attain without laying particular stress on the type of tree (open center, leader type,



A Properly Pruned Apple Orchard

or modified-leader type) upon which they are practiced in pruning the young apple orchard.

Formative Pruning

The grower must first choose the type of tree he wishes to develop. Three types are commonly grown, namely, open or vase form, leader, and modified leader.

The open center or vase type has the leader suppressed and each of the main scaffold branches, which in the more recent pruning consists of from three to five, given equal prominence.

The central leader is maintained in the leader type and the tree assumes the so-called pyramid form. The number of scaffold limbs is limited only to the height of the tree and the fancy of the grower.

The third type, the modified leader, is pruned in the same manner as the leader type for several years, after which the leader is suppressed. Ordinarily from five to eight scaffold limbs are developed.

Trees of greater or lesser strength and bushiness may be developed with any of these types. The variety and the conditions under which it is grown should be a guide to the pruning system. The open-center tree does not grow so high, and perhaps not so large, as the leader tree, consequently it is not advisable to prune a weak-growing variety, planted on thin soil, to the open center, nor to train a strong-growing variety, on extra rich, moist soil, to the leader type. The modified-leader type is a compromise between the other systems. It is gaining favor wherever used, and perhaps, for general use, under all conditions, will give the best satisfaction. Its strong features are ease of application and a strong tree, with the advantages of the other types without their disadvantages.

this spacing is difficult to secure. The further apart the scaffold limbs are, the stronger the tree. For this reason the modified-leader tree is gaining in popularity, since by its use the scaffold limbs may be evenly spaced over a leader from forty-five to sixty inches in length, or even longer if the grower wishes. As an example, if the first scaffold limb issues at a point eighteen inches from the ground, and the others are spirally spaced on a leader of from forty-five to sixty inches long, measuring from the base of the lower limb, a strong, shapely tree can be developed. A tree headed at the above height will not be too low, provided the scaffold limbs are permitted to develop at a sharp, upward angle, which they ordinarily do if not crowded from above.

Two scaffold limbs should not issue on the same side of the tree, one above the other. It gives the effect of a two-storyed tree, and each limb prevents the proper development of the other. The lower one is usually pushed down and out, instead of growing at an upward angle.

Selecting the Limbs

The next step after selecting the scaffold limbs is to develop them in proper relation to each other. If one or two branches run away from the others, the weaker will become side branches of the stronger ones. This can be remedied by careful pruning, which consists of cutting the stronger limbs heavily and the weak limbs lightly. Many growers have adopted the contrary practice, believing the stronger we cut the weak wood the more it will grow.

It is true that the heavier a tree is cut during the dormant season, the heavier the resultant growth. This, however, is dealing with the tree as a whole and not with the relative results obtained by cutting corresponding parts differently; that is, without considering the relationship the limbs bear to each other. The development of a limb is, in a large measure, in proportion to its leaf area. By conserving a large percentage of the leaf area on the weak limb it develops at the expense of the strong branch, whose leaf area was restricted by heavy pruning. If the first year's results are not sufficient to establish balance, a continuation of the treatment will finally give this result. Thus, we find the heading in of the scaffold branches depends, not upon the growth of the tree as a whole, but rather from the viewpoint of the relation of the limbs to each other.

In the opinion of the writer, each scaffold limb should develop and maintain a leader for a number of

Type of Tree

Should the vase type of tree be the choice, the scaffold limbs are all selected at the time the second season's growth is pruned. This is not necessarily true in the case of the leader or modified-leader trees, since the leader is maintained at least for several years and additional branches may be added during subsequent seasons. The problem with any type is to select well-spaced branches, spirally arranged about the trunk. From six inches to a foot apart is a good distance to space the scaffold limbs, but

years. The leader retains its dominance, in the scaffold branches as in the trees, by receiving lighter heading in than the lateral limbs they bear.

Strength of Tree

The ultimate strength of the tree depends largely upon thinning and heading in while the tree is young. The amount of both depends upon vigor. Ordinarily, only scaffold limbs are developed the second spring, and the scaffold limbs are headed in to a length varying from twelve inches to two feet. They are thinned to six inches or more apart, if possible, as previously mentioned. The next spring, second pruning after heading, each scaffold limb may carry one or more lateral branches, depending upon amount and distribution of growth. Usually not more than two laterals are allowed to remain, and often only one. The laterals should be headed in so that they are at least eight inches shorter than the scaffold limb. More scaffold limbs may be added at this time under leader or modified-leader type pruning. If scaffold limbs are headed too much, laterals will spring up too near the main crotches, which will cause crowding during later years. A lateral limb issuing at a point on the scaffold limb closer than fifteen inches from the main trunk is too close and will crowd later. If such a limb starts it should not develop into a main-frame limb, but should be suppressed as the permanent limb develops. On the other hand, if the scaffold limbs and main laterals on scaffold limbs are not headed enough they will be willowy and whip badly in the wind. It is needless to say that only the lateral limbs, developing in the right direction to balance the tree, should be preserved.

The third pruning will consist of further thinning and heading in. Each limb left will bear one or more laterals, headed as described for second spring pruning. By following the leader system in pruning each limb the formation of weak crotches may be avoided. The fourth spring's pruning is lighter and consists of adding more lateral branches, cutting out surplus branches, and heading only enough to maintain balance. The leader may be suppressed at this time if the tree has grown vigorously. This is brought about by cutting out the leader immediately above the top scaffold branch. The small twigs and spurs that develop on the scaffold limb close to the trunk should not be removed. They both shade the trunk and bear the first fruit.

If each year's pruning has been carefully done, but little cutting into wood over one year old need be done, unless it is the removal of an entire limb occasionally. Cutting into old wood usually produces a crooked growth, with heavy water-sucker formation. If such pruning must be done, cut to a lateral limb. Needless to say, all cuts in formative pruning should leave no stubs to decay finally.

Summer Pruning

Up to this point summer pruning has not been mentioned. If it is practiced in formative pruning it takes place in June or early July, and usu-

ally not until the second summer after planting. It consists of the same treatment as winter pruning. This treatment is not recommended to produce fruit, but is thought to bring the trees to the end of the formative period in better condition and in less time than by winter pruning alone. The advocates of summer pruning believe that the balance of the tree is easier to maintain. Winter pruning is lighter, at times consisting of only a small amount of heading in and some thinning. There is also some evidence to show that early fruit wood is produced by summer pruning. It is claimed that this is done without apparently lessening the vigor of the tree to the point where it becomes detrimental. However, regardless of the good that adequate summer pruning may do, the grower must not let his enthusiasm run away with his judgment in its use.

Productive Pruning

Four years of formative pruning is sufficient if the trees have made good growth. The framework of the tree is formed. We now wish to maintain and develop it as we prune for fruit production. It is time to stop heavy pruning. If either too much thinning out or cutting back is practiced, many laterals are formed, as well as heavy terminal growth, which we believe is at the expense of fruit production. Very moderate pruning should be given from the fourth year until the tree begins to bear. Just how much this should be is difficult to say. It is perhaps best to let the tree become too bushy. It can be thinned after bearing begins. However, the dominance of the permanent limbs and balance of the tree should be maintained, with enough thinning and heading to control the tree. There is no doubt that many orchards have been delayed in fruit production due to heavy pruning during the critical period in the tree's age, namely, from four to seven years of age.

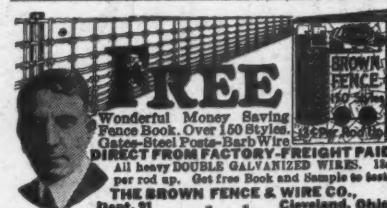
The summer pruning of trees from four to seven years of age may be practiced if the trees are growing vigorously. At this time the grower does not wish to stimulate additional lateral growth, as was the case in summer pruning of the younger trees. In fact, he wishes to subdue it until fruiting occurs, consequently the summer pruning of the older trees is modified, as compared to the younger trees. The aim is now to produce fruit, not wood. This is brought about by pruning later in the season—probably at the time the terminal buds are forming is the best. The time varies with seasonal conditions; however, the month of August may be mentioned as suitable for Virginia. Pruning at this time usually does not force a secondary growth of any extent, but does cause a thickening of the headed limbs and seems to promote fruit-bud formation.

Even though the tree has not developed terminal buds at the time of pruning, and even though it remains in active growth until frost, the summer pruning will lighten the winter pruning and aid in controlling the tree.

The summer pruning consists largely of heading in branches, but

there is no objection to the removal of a limited amount of lateral growth. I would, again, caution the grower against excessive summer cutting, as well as heavy winter pruning, during this period.

After six to eight years the trees should be in regular bearing, and subsequent pruning will be considered in the treatment advocated for bearing trees.



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Orchard Fertilization Experiments

W. H. ALDERMAN, *Horticulturist, West Virginia*

If two men valiantly disagree, usually both are right. We will apply this comfortable theory to the experiment stations whose investigators have studied the orchard fertility problem, for of course the experiment stations must be right, and most assuredly they do disagree. The fruit grower should by all means know what stations have studied the problem and wherein they fail to agree in their conclusions.

We must start with some state, and the one occupying our northeast corner will do as well as any and will allow us to proceed gradually from the north to south until we cross the Mason and Dixon line. In 1909 the Maine station secured a badly neglected apple orchard about twenty-five years old. The station promptly began the work of rejuvenation. In addition to pruning and spraying they plowed and cultivated the orchard for three years and applied annually 1,000 pounds of a 4-8-7 commercial fertilizer per acre. At the end of three years the orchard was in good condition and producing profitable crops. Three plots were then laid off. To the first one no fertilizer at all was added, to the second and third plots 500 pounds and 1,000 pounds respectively of a 4-8-7 fertilizer were applied per acre each year. The variety of apple in this case was Ben Davis. In another portion of the orchard two plots of Baldwin were given an excess application of 100 pounds of nitrate of soda per acre in addition to the standard fertilizer.

After three years of these heavy applications no differences could be detected between the plots either in vigor, tree growth, or yield.

Since the unfertilized plot has maintained itself so well, one can hardly avoid the suggestion that the cultivation probably had more to do with the improvement of the orchard condition during the first three years than did the copious applications of high-grade fertilizers.

New Hampshire Experiments

Another New England state, New Hampshire, acquired a Baldwin orchard in 1908 and began a study of the effects of fertilizers and various cultural methods on fruit-bud formation and fruit production. For the purposes of this article it will be sufficient to say that sod culture, cultivation with no cover crops, and cultivation with cover crops were contrasted, and that a basic application of 2 pounds of nitrate of soda, 4 pounds of sulphate of potash, and 8½ pounds of acid phosphate was made to each tree in all plots except the one used as a check. Three plots were then given an excess of phosphoric acid, nitrogen, and potash, respectively, so that the added benefits derived from a single element of fertility might be tested. All plots in the fertilizer test were given good cultivation accompanied by a cover crop of crimson clover in the late summer. The soil is a light, rather sandy loam, not considered high in fertility. The accompanying table (1)

shows a summary of the results for the first seven years of the test.

Professor Gourley's Opinions

In commenting upon the results of his work, Professor Gourley states: "The use of fertilizers in addition to cultivation and cover crops in this orchard have not as yet increased the fruit-bud formation." That this is true may be readily seen by examining the table, where we find that the plot receiving cultivation and cover crops alone produced slightly more apples than any of the plots to which fertilizers were added. The most striking feature of the experiment is the remarkable gain brought about by clean cultivation over the sod treatment. In this case the difference is not due to the conservation of moisture by the dust mulch, since it was found that there was slightly more moisture present throughout the summer in the sod plot than in the tilled plots. While this condition would not hold on other soil types, it indicates that the presence of the grass itself exerts a more harmful influence upon the apple tree than would a slight shortage of water. This is exactly in accordance with the findings of Spencer Pickering, of the Woburn Experiment Station in England. Gourley found that, in addition to a possible toxic action of the grass roots, the formation of filtrates in the soil progressed much more rapidly in the tilled plot than in the sod plot. Since the nitrates in the sod might soon become deficient in amount, this affords an explanation as to why artificial

fertilizers may show greater benefit when applied to sod orchards than to tilled orchards.

Results in Massachusetts

An illustration of the effects of fertilizers on sod orchards is afforded by a 20-year test in Massachusetts. The orchard was planted in 1890, and hoed crops were grown between the trees for five years, thus affording good cultivation. In 1895 the orchard was seeded down and remained in sod thereafter. Only one year was the grass removed as hay, the rest of the time being cut once or twice a season and allowed to remain upon the ground as a mulch. The accompanying table (2) indicates the kind and amounts of fertilizer applied and the results averaged up to the time the trees were twenty years of age.

In this sod orchard the benefits from fertilization are well marked and in sharp contrast to the results in the cultivated orchards of Maine and New Hampshire. The heavy application of stable manure gave the best results, but the potash and phosphoric acid fertilizers also gave a very good account of themselves. It is noticeable that a low-grade sulphate of potash apparently gave greater return than did the muriate of potash. The soil in this test, judging from the description, is similar to that in the New Hampshire test, and, as other conditions are similar, we may be warranted in assuming that in New England fertilizers may prove profitable in sod orchards but are wasted when applied to well-cultivated trees.

TABLE 1

*CULTURAL AND FERTILIZER TEST IN NEW HAMPSHIRE

TREATMENT	Apples per tree per year	Average twig growth
1. Sod	414	4.53 inches
2. Cultivation—no cover crop	1,264	7.64 "
3. Cultivation—and cover crop	1,256	8.59 "
4. Cultivation, cover crop, and complete fertilizer	1,150	8.91 "
Same as No. 4, but with excess phosphoric acid	970	8.90 "
Same as No. 4, but with excess nitrogen	1,098	9.44 "
Same as No. 4, but with excess potash	1,051	8.99 "

*Adapted from Gourley, J. H., Technical Bull. No. 9, Durham, N. H.

TABLE 2

FERTILIZER TEST IN MASSACHUSETTS

Plot	TREATMENT	Amount applied per acre	Total yield per acre	Circumference of trees—1909
1.	Manure	20,000 lbs.	556.3 bbls.	38.25 inches
2.	Wood ashes	2,000 "	286.6 "	33.28 "
3.	CHECK	87.0 "	27.98 "
4.	Bone meal	600 "	322.6 "	32.27 "
	Muriate of potash	200 "	322.6 "	
5.	Bone meal	600 "	488.0 "	37.02 "
	Sulphate of potash	400 "	488.0 "	

In your November issue you ask for the experience of practical growers as to the sod mulch or cultivation of orchards. I have experimented along this line for years, and have come to the following conclusions: The sod mulch will color the fruit better than the dust mulch, but it also reduces the size of the fruit as well as the size of the crop. Uncultivated orchards are also less vital, and therefore fail sooner than do cultivated ones. Insects are also more troublesome. The best results are always obtained from trees in the back-door yard where there is neither sod nor cultivation. This is suggestive. The back-door

Sod Mulch or Cultivation

JOSEPH GERARDI, *Illinois*

yard is always very fertile, and that tree has undisputed claim to all of that fertility. The poultry reduces the size of the insect ravages to a minimum. But as we can not make back-door yards of our large orchards we must do the next best thing, and that is to fertilize and cultivate our orchards.

Here in the Mississippi Valley July and August are usually very dry months, and cultivation does much

toward conserving the stored moisture, therefore, for this and similar climatic conditions, cultivation is advisable. Where the rainfall is very heavy during the growing season, the sod mulch is to be preferred. This was proven last year. The season was wet and cool, and the apple crop was the largest in yield and size of apples as well as of unusually good color that Illinois produced in many years. Contrary to

the generally accepted theory that sunlight colors the fruit, last year's coloring surpassed any season's coloring since I can remember, and we also had less sunshine than for many years. About the conditions that are responsible for high color in apples we still know very little. In the many years that I experimented along this line nothing occurred to me that is of practical value, and what seemed to apply one season would be contradicted the next. Certain soils have a beneficial influence on some varieties, as also have elevation and climatic conditions.

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Whereas, by reason of abundant crops or by reason of the action of certain produce dealers and organizations which are discouraging and endeavoring to prohibit the purchase of fruits and vegetables by their members, thereby making it necessary for the growers and producers of these products to ship annually on consignment many thousands of carloads to dealers, and

Whereas, there is a great probability of some of such produce dealers making, at times, unwarranted and unfair disposition of such consignments, and

Whereas, we believe that in many instances dishonest returns are made to the shippers on sales of produce thus consigned, and

Whereas, we further believe that the total losses sustained by growers and shippers from this source are greatly in excess of the total losses to the public from bank failures, and

Whereas, our Government has wisely made provision looking toward the protection of depositors in banks by the creation of a department having supervision thereof, and empowered to make and enforce rules and regulations tending to the betterment and increasing the safety of the banks, thereby reducing the losses from this cause to a minimum, and

Whereas, we believe that the relief from and the remedy for this gigantic evil of false returns and unfair disposition of consignments can be obtained only from the Congress of the United States,

Therefore, be it resolved that we memorialize the Congress of the United States of America to create a department in which shall be vested the power and authority and upon which shall devolve the duty of exercising control and supervision of all concerns soliciting or receiving consignments of fruit and produce from organizations and growers herein-before mentioned.

Be it further resolved, that this resolution is in no way intended to reflect discredit upon the integrity of honest and legitimate firms or individuals engaged as brokers, jobbers, or dealers in fruit and produce, but is intended to assist them by removing crooked and unfair brokers, jobbers, and dealers who by their dishonest methods have brought the worthy into disrepute.

Be it further resolved, that a copy of these resolutions be spread upon the minutes of this meeting, and that copies be sent to the Secretary of the National Apple Growers' Association, The Office of Markets, The Fruit Grower, of St. Joseph, Mo., The Kansas City Packer, and The American Fruit Grower, of Charlottesville, Va.

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If the writer were delegated to "sell" the co-operative idea to a group of agriculturists, and were limited to a fifteen-minute talk, he would steer entirely clear of personal opinion and state some very convincing figures and facts. The figures would be selected from the actual experiences of co-operative associations in saving money, and the facts would have to do with the wonderful growth of the co-operative idea, in a few years' time, from nothing to enormous proportions.

The editor of *AMERICAN FRUIT GROWER* is anxious to "sell" the co-operative idea to his readers, so let's get at these figures and facts and see just what they are.

The first step in a large association is neighborhood association and the building of a community packing-house. The economy that comes from co-operative packing is strikingly shown in the case of the California orange growers. The cost of packing oranges has been reduced from 60 cents a box to 33 cents, and of packing lemons from \$1 a box to 60 cents. Yet the pack has been vastly improved.

Incidentally, these growers have found that picking also is best done co-operatively. Their trained gangs of pickers know how to handle the fruit to prevent bruising and consequent decay in transit which formerly amounted to thousands of dollars' loss annually but has practically been eliminated.

Economies of Affiliations

Of the economies that come when locals affiliate into vast marketing organizations I can only mention a few in my time limit. First comes the value of thorough market information, well illustrated when the country's biggest buyer of boxed fruits on one occasion called on the sales manager of the North Pacific Fruit Distributors, Spokane, Wash., to buy ten carloads of prunes. This buyer advanced in turn three arguments why this association should quote him a lower price. First, he said the New York price was low and going lower. Second, he said production in the Northwest was unusually large. Third, he said production in other sections was unusually large. But the association manager had had telegrams that very day from New York from other prune sections, and had a confidential and thorough report of production in his own section, and he was able to disprove with actual figures all three assertions of the buyer. The buyer had to laugh it off and pay the association's price, which was \$1,100 more than he at first stated he would pay. Knowledge is power, in selling.

Another economy comes from having a systematic distributing organization instead of selling through commission houses or to speculators. The California Walnut Growers' Association handles so large a crop that its

exclusive representatives in the various markets can afford to charge only 1½ per cent for their services, whereas non-association growers must pay brokers 2½ to 3 per cent. Where salaried market agents are maintained the saving is even greater.

Dealing with Railroads

Still another economy comes in large-scale dealing with the railroads. Here, again, knowledge is power, and traffic departments representing thousands of farmers can "talk turkey" to the railroads. The California Fruit Growers' Exchange Traffic Department in 1904 to 1912 secured reductions in orange, lemon, and refrigeration rates that totaled a saving of nearly five million dollars to the members of the Exchange.

Then, when national advertising is added, to thoroughly round out the marketing plan, another saving is made in the shape of increased consumer demand to take care of increasing production. Advertising enables the growers to shape the demand to fit their current supply, whatever it may be. While it is often impossible to quote definite figures to prove an economy from advertising, that the California Fruit Growers' Exchange, which spends nearly half a million dollars a year for advertising, has the lowest selling cost known for marketing an agricultural product—3 per cent—is excellent circumstantial evidence.

In the case of the Florida Citrus Exchange, also an advertiser, a Tampa newspaper recently estimated that in the past few years exchange growers of the State have averaged 25 cents a box higher for their oranges than have outside growers. As the publicity tax per box is only 3 cents, this is pretty conclusive that it pays to have a brand and to advertise that it represents highest-quality fruit.

That results from intelligent co-operation are sometimes immediate is shown by the recent experience of the California prune growers. These growers were unorganized in the spring of 1915, but reports at that time that packers and other speculators were selling "futures" in the East at ruinously low prices, thinking they could buy still lower, roused the growers. They called a mass meeting and appointed a committee to investigate the size of the crop, and learned that, contrary to the reports spread by the packers, it would not be unusually large. The committee advised all growers to hold out for a five-cent-per-pound base. Some were timid and did not do so, but those who did hold out secured their price, or very close to it. It was figured that this first co-operative step saved the growers half a million dollars, and steps are now being taken towards thorough organization for marketing.

The spread of co-operative marketing by farmers since its beginning in Denmark in 1882 surprised the

United States Office of Markets and Rural Organization, and will no doubt surprise many farmers. The government secured the names and addresses of over 10,000 marketing associations of farmers in the United States alone.

There have been, broadly speaking, three great movements. 1. The co-operative creamery movement. 2. The co-operative grain-elevator movement. 3. The co-operative fruit-marketing movement.

The first co-operative creamery was established by a small group of Denmark farmers in 1882. These farmers had already learned the value of co-operation through their cow-testing associations, cattle-breeding associations, etc. The success of the creamery venture was so marked that by 1909 three-fourths of Denmark's milk was being handled in co-operative dairies, there being 1,157 co-operative creameries. The last available figures from other European countries show that Germany has over 3,500 such creameries, Switzerland over 2,000, Ireland over 400. In the United States the movement has reached into every cream-producing territory. In 1911, out of 6,300 creameries in the country, 33.6 per cent were co-operative.

Co-operative cheese factories, egg circles, bacon-shipping associations, etc., have developed in Denmark and elsewhere more or less as a part of the same movement.

Grain Elevators

The co-operative grain-elevator movement had its beginning at Rockwell, Iowa, where an elevator was established in 1889 in an attempt to reduce grain-handling costs. The company was vigorously attacked by the line companies, but stood its ground, and, according to some recent figures, there are to-day 2,577 farmers' elevators in the Central States, seven states having over 250 each. All seven states have state associations or federations of elevator companies. These have not, however, made as great progress in large-scale operating as have the four great Canadian elevator companies, which, after nine years of existence, have over 50,000 farmer members and have handled over \$150,000,000 worth of grain.

The remaining movement to be chronicled is that which began with the organization of the California citrus fruit growers in 1893, following an unsuccessful attempt in 1885. From handling at the start 25 per cent of a 5,000 carload crop, the California Fruit Growers' Exchange now handles 65 per cent of a 45,000 carload crop. This organization's success stimulated emulation as early as 1899, when the first local almond association was formed. The California Almond Growers' Association now controls the State crop. Two deciduous fruit organizations were formed about 1901 in California; and

later have come two dried-fruit organizations, a walnut growers' association now controlling four-fifths of the most important walnut crop in the world; the California Associated Raisin Company; the lima bean growers' association; the rice growers' association. California ripe-olive growers, peach growers, and prune and apricot growers are this year completing the formation of co-operative associations.

In Other States

Outside of California the influence of the citrus growers has been felt directly in Florida, where the growers' association now controls 25 per cent of the citrus crop. It has also been felt throughout the country, as evidenced by the numerous fruit and produce associations that have been formed in every state. Michigan alone has over 500 such organizations.

The establishment at Washington of the Office of Markets and Rural Organization was a recognition of the co-operative marketing movement. Senator Shepard has recently proposed a bigger step by the government, having introduced in Congress a bill for the establishment of a National Chamber of Agriculture to systematize all marketing. There has been quite general criticism of the bill as idealistic and impracticable, but that such a bill has been introduced is, nevertheless, significant.

The result figures given in this article, together with the phenomenal spread of the co-operative idea into nearly every field of agriculture, surely constitute a strong argument for co-operative marketing. There have been many failures of co-operative undertakings, true, but in such cases the special reasons have not, as a rule, been hard to discover.

HOGS NO HELP IN ORCHARDS

It is frequently claimed that an orchard is benefited by turning hogs into it. They eat up so much refuse, that they help to reduce the number of pests that always harbor in rotting fruit.

They do this and more. They eat the bark, and often girdle trees, thus causing their death. It is true that a hog fed on ideal rations is less apt to resort to gnawing bark, but it is a risky thing to rely upon furnishing exactly the food that will satisfy their craving for the kind of nutrient found in the bark. With hogs, as with people, there are certain individuals that have what is called a morbid appetite, and one hog with such a taste may do more harm than all the rotten fruit the whole of the rest of the bunch will eat.

All hogs rub themselves against the trees, and this also is injurious to the bark. Best get a separate pasture for your live stock or give up the idea of raising both hogs and fruit.

Dusting—40 ACRES A DAY

Proven by Actual, Practical Experience

AN especially successful method of protecting Southern Orchards. The outfit is so light—Duster and Engine weigh only 1,000 pounds—it is particularly adapted to hill-side orchards. There is no going for water, and the method is so quick that frequent applications can be made over large acreages. DUSTING has been successfully used on Peaches for controlling brown rot, scab, curculio and other pests, and just before harvest to obtain high color. The danger of burning fruit or foliage is entirely eliminated by DUSTING.

SEND FOR FREE BOOK ON DUSTING

Containing complete history of DUSTING, giving the experience of commercial orchardists in various sections of the country and describing fully both *Niagara Dusting Machines and Materials*. Write to-day for this free book and see how you can save 25% in cost of protection and do away with all the dirty, sloppy drudgery of spraying.

NIAGARA SPRAYER COMPANY
68 MAIN STREET MIDDLEPORT, N. Y.

K. C. DUSTERS

USED AND ENDORSED BY CORNELL UNIVERSITY



IDEAL DUSTER

This Is The Machine That Got The Results In State Experimental Tests

CORNELL UNIVERSITY says: Dusting with the *Ideal* is 5 to 10 times faster than power liquid sprayers.

Results Are Better—Cost Is Less

THE K. C. DUSTERS ARE THE BEST. They are the STANDARD APPLIANCES for orchards and all kinds of crops. They have the perfected features that insure saving of time and material. The K. C. DUSTERS DO NOT CHOKE OR CLOG with dry materials under any conditions. The positive, adjustable feeding and delivery principles are features quickly and accurately controlled by one hand of the operator while directing the application with the other.

Send for Our 1917 Catalog TO-DAY—Do Not Put It Off

YOU WILL NEED TO PLACE YOUR ORDER EARLY FOR K. C. DUSTERS

DUST SPRAYER MANUFACTURING COMPANY
1416 St. Louis Avenue KANSAS CITY, MO.

Spray Your Fruits and Vegetables with an Eclipse Spray Pump

THE FIRST SUCCESSFUL SPRAY PUMP MANUFACTURED

For 28 years we have been supplying fruit growers with spraying utensils. One of our largest customers is the U. S. Government. Could there be a better endorsement? Send for our free literature and get our special proposition—a liberal one.

MORRILL & MORLEY MFG. CO.

BENTON HARBOR, MICH., Box 90

First in the Field with a Successful Spray Pump



Kindly mention American Fruit Grower when writing to Advertisers

LEAVES FALL IN UNSPRAYED ORCHARDS

G. E. SANDERS, Nova Scotia

In comparing the fall of the leaves in the sprayed and unsprayed orchards, we may at this time of the year see the reason for one orchard having a full strong bloom next spring, while the next orchard may have a short weak bloom. Other conditions, such as cultivation, being equal the sprayed orchard will invariably hold its leaves later in the fall, and so develop a stronger better fruit bud for the following spring. One of the best instances of this was in Prof. Brittain's Experimental orchard at Bridgetown last season. In 1915 ten sprayed Golden Russet trees gave a crop of apples worth \$2.46 per tree, and held their leaves until November 5th, while ten unsprayed Golden Russet trees in the next row averaged 69½ cents worth of apples per tree, and dropped their leaves about October 20th.

This spring the ten sprayed trees had a fine full coat of blossoms, while the unsprayed trees had practically no bloom. The cultivation and the fertilizing in the two rows has been identical for three years.

It is unreasonable to expect a tree which drops its leaves early in the fall to form as strong and as healthy fruit buds as the tree which holds its leaves until the frost kills them. Spraying, therefore, not only keeps the crop of the current year clean, but it increases next year's crop more than any other single factor. This is the reason why men who spray continuously and well are almost without exception getting continuous crops of apples, while their neighbors who do not spray may have one enormous crop followed by two or three off years.

Compare some orchards in regard to the dropping of the leaves.

DON'T BLAME THE BEE

Many complaints are made—especially by grape growers—of the injury inflicted by bees, yet from Italy, the home of the bee, comes the report of a committee appointed to make a special study of the bee in this regard, which is wholly to the credit of the little honey maker.

They report that bees are physically unable to perforate the skin of fruit, and that when they are seen at work on injured fruit the injury has been caused by hornets, wasps, vine moths, etc., etc., and the useful bee is but sucking the exuding juices.

All of us know the beneficial effect of bees in aiding the pollination of orchards. It would not be giving the bee a square deal to fix upon him a crime of which he is not guilty. It would be as much of a loss to the fruit grower as to the regular apiarist if bee culture were discouraged.

The question is interesting, and it would be useful to hear the experience of grape growers and others. Caution should be taken to prove that the original injury was caused by the bees, before reporting that damage was really done by them.

"Great Crops of STRAWBERRIES and How To Grow Them"

is the best and most complete book on Strawberry Growing ever written. It fully explains the KELLOGG WAY of growing two big crops each year—a big profit in the Spring and a bigger profit in the Fall. Tells everything about strawberry growing from start to finish. Write for this book and learn how to supply your family with delicious strawberries the year 'round without cost, and how to make \$200 to \$1000 per acre each year. The book is FREE.



Picking Strawberries in October

Strawberries grown the KELLOGG WAY yield more dollars per square rod and do it in less time than any other crop. The profits made from strawberries are enormous. One acre of strawberries grown the KELLOGG WAY will yield a greater cash profit than twenty acres of common farm crops.

\$1412.50

is the amount Frank Flanagan of Oklahoma made in a single season from one and one-half acres of Kellogg Pedigree Plants grown the KELLOGG WAY. Others are doing fully as well. One 64-page free book will tell you how to make these big and quick profits. A postal will do—the book is FREE.

FREE BOOK
R. M. Kellogg Company, Box 110, Three Rivers, Mich.

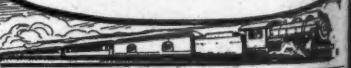


This Florida Farm Now Ready For You

In Pasco County highlands, along Seaboard railroad, near prosperous county seat town, heart of orange and citrus country, fine live stock and excellent land for winter vegetables; produces big crops corn, hay and other staples. Forty acres and up; rich, virgin land; part each farm just cleared; new house, barn, well; fresh cow, two pigs, dozen chickens.

Business men to build up this community, have prepared farms; Seaboard, progressive railroad of the Southeast, is selling farms for them and helping buyers to succeed through its farm experts, that its tonnage may be greater. These ready-to-cultivate farms now offered at prices which will give you benefit value increases you assist in creating. Terms, full details and copy Seaboard Magazine free if you will address

B. L. HAMNER, Gen. Dev. Art. Seaboard Air Line Railway Co., 974 Royster Bldg., Norfolk, Va.



IRON AGE

Farm, Garden and Orchard Tools Answer the farmers' big questions. How can I grow crops with less expense? How can I save in planting potatoes? How make high priced seed go farther? The

IRON AGE Potato Planter solves the labor problem and makes the best use of high priced seed. Meants \$5 to \$50 extra profit per acre. Every seed piece in its place. Sows only one piece. Sows 1 to 2 bushels seed per acre. Uniform depth, even spacing. We make a full line of potato machinery. Send for booklet today.

No Misses
No Doubles
Bateman Mfg. Co., Box 9 B, Grenlock, N. J.

FORD OWNERS

—Worth Dollars, Costs You Nothing. Tells how to Drive, Overhaul, Repair, Proper Care etc. Shows improved equipment, accessories, etc. Makes cars more valuable. One owner says: "Would not part with for \$5." Return this ad for offer of \$2 Modern Equipment for \$1 and Free.

Modern Specialty Co. F St., Racine, W. I., Salisbury, N. C.

Kindly Mention American Fruit Grower when writing to Advertisers

SUCCESS WITH STRAWBERRIES

The strawberry always has been and is the queen of small fruits. It thrives on all types of soils and in all climates. Of course, every one should have a patch to supply the home table. And, nearly all fruit growers find the strawberry a staple cash crop—a real money-maker—whether grown for local market or for shipping.

In order to succeed with strawberries you must, of course, start right with plants of high quality and of varieties suitable for your market. The photos at the right illustrate familiar scenes at a noted strawberry-plant farm. Starting in a small way, the acreage has been gradually extended until this concern now has over 200 acres devoted exclusively to the growing of strawberry plants.

This firm consists of the father and three sons, all of whom are bred to the business. One and all, they are striving to produce true-to-name plants that will yield big crops of fancy berries in the hands of their customers. How well they are succeeding is best shown by their ever-increasing business.

The first step in growing these high-yielding plants is to heavily fertilize the ground. Stable manure for this purpose is shipped in by the trainload from New York City. A part of the manure is applied in the form of top dressing.

Set in rich soil and kept thoroughly hoed and cultivated, the plants grow with great vigor and multiply rapidly. They are a beautiful sight when in full bloom. (See Fig. 1.)

The bulk of the plants are dug and packed during the months of March and April. The regular shipping season ends May 1st. Orders after that date are shipped at the purchaser's risk. Great care is exercised to remove the roots in good condition.

The plants are taken directly from the field to the packing-house. Every precaution is taken to keep the plants fresh. To this end the main floor of the packing-house is of dirt—prevents drying out.

The plants are sorted into bunches of 25 each. Fig. 2 deserves special study. Notice the magnificent root systems, the well-cleaned plants, and the method of labelling—you can't get the plants mixed. The box has been carefully designed to admit the air and yet prevent the roots from drying out.

The plants are now ready for shipment. In Fig. 3 we see one of the teams starting for the railway station. This load represents the order of a single large grower, 186,000 plants. That big grower must have a lot of confidence in the vigor and quality of these plants.

The subject of varieties is a complex one, and each grower must select those adapted to his individual needs. Many growers, both beginners and veterans, have found Allen's Book of Berries a great help in making an intelligent selection. This useful fruit guide lists and accurately describes all the best varieties of strawberries. It is handsomely illustrated, and makes everything so plain you can hardly go wrong. Why don't you write for it to-day and learn how strawberry profits are made? A postal request will bring it to your door, postpaid. Address the W. F. Allen Co., 161 Market St., Salisbury, Md.—Advertisement.



Fig. 1.—Plant Beds in Blossom.



Fig. 2.—Crate of Plants and Individual Bunches.



Fig. 3.—Starting for the Station.

USE SUBSCRIPTION BLANKS

In this issue of the AMERICAN FRUIT GROWER you will find a subscription blank for your convenience in renewing your subscription. If your subscription is already paid in advance, we thank you, and make a further suggestion.

Use this subscription blank for sending us the name and address of a friend to whom you would like to make a gift of a year's subscription to this magazine. We know that you have a number of friends who would be interested, and who would appreciate this gift from you.

The present subscription rates are 50 cents per year, or three years for \$1.00. If the present price of white paper continues it will be necessary to increase the subscription price at an early date. Better subscribe now while you can get three years for \$1.00.

BULLETINS WORTH READING

Irrigation of Peaches

"Irrigation of Peaches" is the study of Bulletin No. 142, 1916, of the Utah Agricultural College Experiment Station. The experiments were made on the Early Elberta variety, and should be useful to those of our Appalachian peach growers who cultivate this peach commercially.

Fruit Tree Root Systems

Bulletin No. 143, 1916, of the Utah Agricultural College Experiment Station, "Fruit Tree Root Systems," deals with facts relating to the main roots of fruit trees and their larger branches. While the work was done locally, it is most probable that it would serve to throw considerable light on the root troubles which are plentiful in our section.

Cultural Methods

Bulletin No. 141, 1916, of the Pennsylvania State Agricultural College, "Cultural Methods in Bearing Orchards," gives the result of six experiments in bearing orchards, covering a period of eight or nine years. The object is to determine the true influence of cultural methods on the economic characters in apples, and eventually to determine the reasons for the effects observed. A wide range of varieties of apples, types of soil, and number of trees entered into these experiments.

HEAVY FERTILIZING PAYS

F. H. Ballou, of the Ohio Experiment Station, has concluded from his tests that applying 10 pounds each of nitrate of soda and acid phosphate, and 5 pounds muriate of potash per tree, will give returns of about \$20.00 per acre more than would half this quantity with a mulch of one bale of hay. In the tests he conducted the more heavily fertilized tract returned \$13.00 more per acre in fruit, and \$7.00 more per acre in grass, than that with lighter fertilization and mulch.

HOW TO BUY TREES

When starting an orchard every grower questions what varieties he should plant. Let us advise him to use such well-known varieties as have proved suitable to the soil of his locality. If he wishes to experiment a bit, let him regard this as a luxury, and let him carry on his experiments in NEW varieties, somewhat apart from his commercial orchard.

It is generally cheaper and more reliable to buy your stock from an established nursery than from an agent. Even if he be an accredited representative of some good nursery, he is a middle man, and as such entitled to his percentage, but the wise farmer will not pay it to him. He will go to the nearest nursery of which he knows the reputation, or if such be lacking, he will be guided in his choice by the advertisements he sees in his fruit paper.

All farm papers now make an honest effort to carry only such advertising as is backed by reputable firms, and the farmer saves himself time, trouble and expense by making use of its columns to direct him in making his decisions.

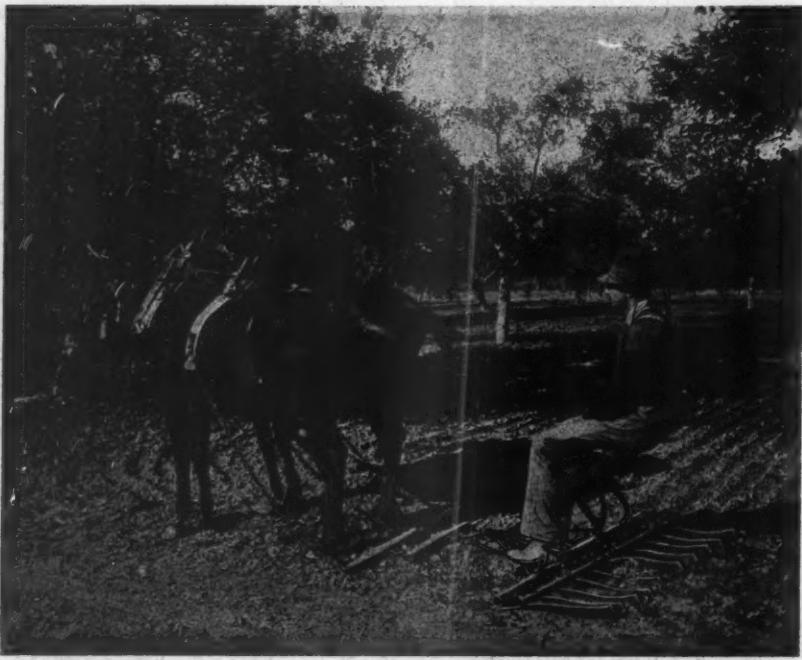
INTENSIVE ORCHARD TILLAGE PAYS

Thoughtful orchardists realize that trees are simply large plants. The slender roots penetrate for many feet in every direction. Every rootlet has many soft jelly-like root-hairs too small to be seen by the naked eye. These tiny root-hairs must absorb all the moisture and food that go into the growth of the tree and into the fruit. So your orchard needs just as careful cultivation as your cornfields. This is not mere theory, but is supported by the test of experience.

Some two years ago a thorough survey was made of a large number of orchards in the famous Shenandoah Valley under the auspices of the West Virginia Experiment Station. Nearly 1,000,000 apple trees and 150,000 peach trees growing upon many types of soil were included in the report. About one-half of these trees were of bearing age.

Now here is what these investigators found out: Cultivation pays, and pays big. "For instance, when 16 orchards, comprising 641 acres, kept in clean cultivation since bearing, were compared with 12 orchards comprising 148 acres, kept in permanent sod, we find an average difference of 28 barrels of apples and \$72.71 income per acre in favor of the clean cultivated orchards, or, in other words, the cultivated orchards are returning 108.3% more per acre than the sod orchards. The high yielding tilled orchards are always seeded with a cover crop of vetch or clover each fall." (O. M. Kile in AMERICAN FRUIT GROWER, July, 1916.)

Granted, then, that orchards need tillage, how shall we go about it, and what tools shall we use? As early in the spring as the ground is dry enough to work, the cover crop should be turned under. At intervals of about ten days or after every rain the orchard should be harrowed. For this purpose, you need a tool that is light in draft and that will work right up close to the trees. Coulter harrows, such as the one illustrated below, will do the work admirably.



A Clean Orchard Means Healthy Trees—Use the "Acme"

In this type of harrow sharp knife-like blades are used in the place of teeth. These long blades are so shaped as to present the least possible resistance to the ground. Each coulter turns a little furrow, slicing and pulverizing the soil. Crushing spurs, one between each pair of coulters, increase the thoroughness of the tillage. The coulters cut through to the plowed-under cover crop, chopping it up and mixing it with the soil. The lower soil is made firm, thus establishing moisture connection with the subsoil. The harrow leaves several inches of loose mulch. This prevents the escape of soil moisture through evaporation.

If the harrowing has been faithfully done during the summer and early spring little or no preparation will be needed for seeding the cover crop. This had usually best be done during the month of July.

Yes, intensive orchard tillage pays. Good tools and thorough work insure thrifty trees that grow rapidly and bear heavily. Plan now for next spring.—Advertisement.

DESTROY TENT CATERPILLAR

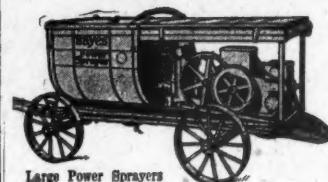
In spring the tent caterpillar is most conspicuous—particularly in wild cherry trees, and in old, half-decayed apple trees. Every observer knows how the caterpillars feed on the green leaves in the morning and afternoon, and return to their nests—or tents—by day and night, until they leave the tree completely defoliated and sometimes so weakened that it dies.

In the autumn the eggs which will do so much harm next spring are easily to be seen in clusters upon twigs or small branches of fruit trees. They form a broad band, encased in a water-proof cement, safe from storms. At this season it is a simple matter to discover and destroy them. Most of the twigs so infested can be removed with pruning shears and burned. This is the most effective method of control.

Battling with the live caterpillars in the tents, or trusting to their many insect enemies to diminish their numbers, is an uncertain and troublesome way compared with the use of pruning shears now.

Stamp out all Crop Destroying Pests with **FRUIT-FOG**
The Scientifically Atomized Super-Spray Produced by Hayes Sprayers.

A FEW OF OUR 50 STYLES



HAYES

Hand and Power Sprayers

FRUIT-FOG envelops everything with a vapor fog of solution; filters into tiniest crevices in bark; gets under bud scales; beneath fleshy stamens of apple blossoms; reaches both top and bottom of leaves.

FRUIT-FOG deposits a light film of solution; will not injure tree. Being vapor no drops form and run off. This means a big saving. FRUIT-FOG requires only a small amount of solution. Gives greater capacity with same size nozzle; saves time; cuts cost.

GUARANTEED! Hayes Power Sprayers are tested to 500 pounds pressure and GUARANTEED to maintain 300 pounds working pressure at full rated capacities, and give many years of service.

We make 50 Styles of large and small Hand and Power Sprayers for orchards, field crops, shade trees, hops, poultry, painting, farm, home and garden use. Complete equipment or separate spray pumps, hose, nozzles, fittings, bamboo rods, etc.

Hayes Hand Sprayers are built to give maximum pressure and capacity with minimum power to operate.

FREE—Spraying Guide. Tells when and what solution to use for different pests. We will include interesting story of FRUIT-FOG and complete 64-page catalog. Check and mail coupon at once.

HAYES PUMP & PLANTER CO.
Dept. P Galva, Ill.

HAYES PUMP & PLANTER CO.
Dept. P, Galva, Illinois
Send Free Spraying Guide, book on FRUIT-FOG and 64-page catalog.
I am interested in:
 Power Sprayers
 Hand Sprayers
(Check which item interests you)
Name _____
Address _____

Strawberry Growing Brings Profit and Pleasure

Whether you grow strawberries extensively for a distant market, moderately for a local market, or just for home use, it is important to start right. Allen's Illustrated Book of Berries for 1917 describes all the best varieties for every purpose. Shows how

Allen's True-to-Name Plants

are grown and why they are the best. Tells how to grow fancy strawberries and how to make money from growing them.

For over 80 years, we have been growing small fruits of quality. We now have more than 300 acres devoted exclusively to their culture. Allen's Plants are guaranteed to be exactly as represented, to be packed fresh for shipment and to arrive in good condition.

Send for 1917 Book of Berries
It is packed with facts of interest to every farmer, fruit grower, poultryman and suburbanite.
Send a postal for your copy today—free.

THE W. F. ALLEN COMPANY
161 Market St. Salisbury, Md.

SHIP
STEVENS BROTHERS
BALTIMORE, MD.

Headquarters for

PEACHES, APPLES
ALL FRUITS AND VEGETABLES

REFERENCE: Merchants' and Mechanics' National Bank.
MEMBERS: National League of Commission Merchants of United States and International Apple Shippers' Association.

Kindly mention American Fruit Grower when writing to Advertisers

IMPORTANT MEETINGS

West Virginia State Horticultural Society, meeting at Morgantown, W. Va., January 3. Carlton C. Pierce, Secretary, Kingwood, W. Va.

Washington State Horticultural Association, meeting January 3 to 5 at North Yakima, Wash. J. A. Harder, Secretary, North Yakima, Wash.

New York State Fruit Growers' Association, meeting at Rochester, N. Y., January 3 to 5. E. C. Gillette, Secretary, Penn Yan, N. Y.

Peninsula Horticultural Society, meeting at Dover, Del., January 9 to 11. Wesley Webb, Secretary, Dover, Del.

Massachusetts Fruit Growers' Association and the State Board of Agriculture will hold joint convention in Springfield, Mass., on January 9 to 12. Albert R. Jenks, Manager of Exhibits.

National League of Commission Merchants meets at Philadelphia, Pa., January 10 to 12. R. S. French, Secretary, 90 W. Broadway, New York City.

Chautauqua and Lake Erie Fruit Growers' Association, meeting at Brocton, N. Y., January 13. A. M. Loomis, Secretary, Jamestown, N. Y.

Georgia State Horticultural Society, meeting at Athens, Ga., sometime during the latter half of January. T. H. McHatton, Secretary, Athens, Ga.

South Dakota State Horticultural Society, meeting at Watertown, S. D., January 16 to 18. Professor N. E. Hansen, Secretary, Brookings, S. D.

Virginia Road Builders' Association meets at Norfolk, Va., on January 16 to 18. C. B. Scott, Secretary, Richmond, Va.

Montana State Horticultural Society, twentieth annual meeting at Plains, Mont., January 17 to 19. O. B. Whipple, Secretary, Bozeman, Mont.

Pennsylvania State Horticultural Association, meeting at Harrisburg, Pa., January 23 to 25. F. N. Fagan, Secretary, State College, Pa.

Alabama State Horticultural Society, meeting at Mobile, Ala., January 24 to 25. J. C. C. Price, Secretary, Auburn, Ala.

Western New York Horticultural Society, meeting at Rochester, N. Y., January 24 to 26. John Hall, Secretary, Rochester, N. Y.

Ohio State Horticultural Society, meeting at Columbus, Ohio., January 30 to 31. R. B. Cruickshank, Secretary, Columbus, Ohio.

The Western Association of Nurserymen will meet at the Coates House, Kansas City, Mo., Wednesday, Thursday, and Friday, January 24, 25, 26.

Ohio State Corn Show, Columbus, Ohio, January 29 to February 2. C. A. Gearhart, Secretary, Wooster, Ohio.

Kansas Fruit Show, Manhattan, Kan., February 5 to 10. Professor F. S. Merrill, Secretary, Manhattan, Kan.

WINTER HEATING OF PEACHES

Because of the difficulties in heating peach orchards in winter, horticulturists at the Ohio Experiment Station advise growers to avoid such operations by planting hardy varieties and selecting favorable planting sites. The exact temperature required to save the blossom buds in extreme cold winter weather is not known, as varieties differ in hardiness, and the same variety may show some variation in resistance to cold from year to year.

Without this knowledge orchardists in some cases may waste fuel, while at other times buds may be frozen because the fires do not keep the temperature high enough. Watching thermometers and keeping fires in zero weather is trying work. Spring orchard heating, however, has long been considered successful.

On suitable locations peach crops may be secured annually if hardy varieties are planted, these specialists say. Winter heating is therefore unnecessary in such cases.

TO CONTROL SCALE INSECTS

Spraying fruit trees with lime-sulphur wash and with soluble oils controlled San José scale when properly applied, while powdered sulphur compounds gave promising results in experimental tests conducted by entomologists of the Ohio Experiment Station. Cure-alls were unsuccessful.

Little difference in effectiveness was noted between home-boiled lime-sulphur and the commercial form mixed with seven parts of water and applied in early spring. Soluble oils, mixed with fifteen parts of water, are also recommended.

Powder sprays, as soluble sulphur compound, barium sulphur and Modoc soluble sulphur, gave variable results in killing the scale insects. The Station experts do not discriminate against such materials, but say they should be used only in an experimental way.

Treevax and Derror's tree fluid, said by manufacturers to cure all ailments of trees, had no effect in controlling either insects or plant diseases.

SENDING APPLES BY PARCEL POST

After three years' trials in sending apples in corrugated strawboard cartons by parcel post, the Department of Horticulture of the Ohio Experiment Station has found that the fruit will carry to almost any distance with little or no injury. The use of parcel post, however, is not advised for shipments beyond the second zone because the postage is much greater than the express rate.

Half peck and peck boxes were sent to several different states, including Colorado, Texas, and Florida. One box was sent to British Guiana. In practically all cases the apples reached their destination with no or only slight bruises. The one-piece slotted package was found the most satisfactory type for shipments.

Meeting of Virginia Horticultural Society

The twenty-first annual meeting of the Virginia Horticultural Society took place at Roanoke, Virginia, December 5th to 7th. The occasion was unusually interesting. It was noted that the membership had increased during the past year from several hundreds to more than 1,000, under the leadership of Secretary Wm. P. Massey.

The exhibit of fruit, in charge of Director of Exhibits, Russell P. Bargamin, was a splendid display, exceeding in quantity and quality any that had so far been shown by this society. Mr. J. P. Carey, of Canada, a demonstrator and instructor for the Dominion Fruit Commission, highly complimented the exhibit, which he pronounced to be the finest he had seen anywhere. A notable feature was the large number of by-products shown.

The most important discussion was that of the proposed "Packing and Grading Law for Virginia," led by the Hon. S. L. Lupton, of Winchester. A warm debate, lasting several hours, showed a gratifying readiness on the part of growers to come up to the highest standards set elsewhere, and, in the particular of color for the "fancy" grade, to go above what other states have done, and 85% was adopted. It was decided that no decayed apples could be packed. A step in advance was the resolution, staunchly advocated by Mr. Carey, of Canada, "the face shall fairly represent the contents of the barrel."

Office of Markets

The subject that to many took next rank in interest, related to the co-operation between growers and the Virginia Office of Markets. It was pointed out that the Southern markets are the natural outlet for Virginia apples. Means of further developing and improving this market were suggested. The packers were told that they must deal as fairly with the commission men as they expected to be dealt with by them. Sundry bad practices on the part of unreliable packers were exposed, and a more lenient disposition toward the dealers

who are subjected to such practices was advocated. The question of color was dwelt on, and orchardists were told that the South, beyond all other markets, demands high color. This did not daunt the growers, as Virginia prides herself on the choice coloring of her apples. Advertising Virginia apples was strongly recommended, it being the conviction of the orchardists that the apples they raise are superior, and only lack thorough advertisement to take their place as the fruit most sought after by dealers and consumers.

The usual discussions of pest-control, fertilization and cultivation, proved that apple men now realize the hopelessness of engaging in commercial fruit growing without taking precautions to rid their trees of pests, to provide them with the necessary nourishment, and to furnish them with suitable growing conditions. Science leads the way and practical experience is the basis of the final conclusion as to the advantages of any method. The interchange of experiences among men from all over the State who are engaged in similar pursuits, is most beneficial to all.

Officers elected were: C. Purcell McCue, of Greenwood, President; William P. Massey, of Winchester, Secretary; E. W. Woolen, of Crozet, Treasurer.

CORN LACKS LIME

Because of its low content of mineral matter, particularly lime, corn should not be fed as the sole concentrate in rations for swine. Bodily weaknesses result from a deficiency of mineral elements when other feeds are not supplied with corn.

In experimental feeding tests conducted by Dr. E. B. Forbes, of the Ohio Experiment Station, hogs fed mainly corn had weak bones, often resulting in lameness and fractures. Such injuries do not occur with hogs on pasture or with those given feeds rich in lime, such as clover, alfalfa, rape, skimmilk and tankage. Bone flour, wood ashes, corn cob charcoal and lime are useful supplements to rations deficient in minerals.



Starcher Sizing Machine in Arkansas



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ADVERTISING RATES: \$2.10 an inch

ADVERTISEMENTS of meritorious articles needed by the fruit grower and farmer solicited. Fraud and irresponsible firms are not knowingly advertised, and we will take it as a favor if any readers advise us promptly should they have reason to question the reliability of any firm which patronizes our advertising columns. Discriminating advertisers recognize the AMERICAN FRUIT GROWER as the best medium in the Middle Atlantic States through which to reach the most intelligent and up-to-date fruit growers and farmers. Rates: \$2.10 per inch. No disguised advertisements are accepted at any price.

Communications are solicited from practical fruit growers. Names and addresses must accompany all communications, although they will not be published if so requested.

Photographs of scenes are gladly received, and will be reproduced if of general interest, and clear enough to make satisfactory plates.

QUESTIONS—Subscribers are at liberty to ask questions on any phase of fruit growing, and will be answered through the paper or by mail as promptly and carefully as possible. We do not answer questions from those who are not subscribers. When writing for information always give name and post-office address, and enclose a two-cent stamp if answer is desired by mail.

All correspondence should be directed to the paper at Charlottesville, Va., and not any individual connected with it.

Entered as second-class matter at the post-office at Lynchburg, Va.

EDITORIALS

HIGH COST OF LIVING COMES HOME

This year for once the fruit grower has been getting nearer a fair share of the selling price of fruit. He gets part of what is coming to him, not all. But his net income is little larger, for the high cost of living hits him in every thing he buys. He is a consumer, too, and in the market, where high prices gouge him as they do other consumers, his extra profit goes back in extra costs.

The orchardist will pay more for machinery, fertilizer, sprays, tools, coal, cement, gasoline, furniture, clothing, and food stuff he doesn't raise. His freight bills are larger. His labor costs him more. His big agricultural plant is not self-contained. He must buy many things, and on all he is exploited.

Meanwhile the city people pay more than ever in our history. Where does the surplus go? That's the bitter, urgent question for the rural and urban workers to answer. Both are producers, and both are consumers. The producer at either end can not slip it on to the consumer, for the latter slips it back. There is no sense in this vicious circle. Their interests are identical. They must unite.

They must join to cut out exploitation all along the line. The parasitic middle men must be eliminated. The waste and inefficiency of the distribution system must be done away with. The blood-sucking interests who take toll on every product in both directions, but who render no real service, must be fought.

The producer in the country is not trying to starve the worker in the city. Both need a square deal. How to get it by joint action is the largest economic and political issue now in the nation.

WE SHALL MISS STARCHER

Virginia fruit growers will miss George C. Starcher, for six years associate horticulturist at the Virginia Polytechnic Institute. He became on January 1st head of horticulture for both college and experiment station at the Alabama Polytechnic Institute.

Starcher did much for Virginia fruit. His field demonstrations and practical talks were fine missionary work. His energy, his faith in the Appalachian fruit section, his youth and enthusiasm, made him a vital fact in Virginia horticulture. Probably his greatest service to growers was his high ideal of "packing." His memorial in Virginia will be "He believed in a good pack."

The editors of the AMERICAN FRUIT GROWER will miss him in many ways. His articles, his advice, his answers to questions—all were of real and lasting value to us and our subscribers. We trust still to print the ideas and ideals of George Starcher, even from the new field where we wish him all success. After all he is still a worker in the great Appalachian fruit belt.

"The Stencil Should Tell the Truth." Well and good—and so should the Label on the food, clothes, drugs, and machines we have to buy.

In the South, rural folks are not "Snow Bound" like Whittier's New Englanders. They are "Mud Bound." That isn't so pretty and poetical.

We need more rural statesmen. We have too many city politicians. The country should have more representatives on state health boards, school boards, tax boards. It is vitally interested—and helps foot the bill. No big state interest affects the city alone.

OUR FIRST YEAR AND THE FUTURE

Beginning its second year the AMERICAN FRUIT GROWER repeats its platform: To help fruit growers to grow more and better fruits, to market them at greater profit, and to secure a noble and happy rural life. That creed is big enough to inspire us to hard work, broad visions, new plans. We ask your help that we may grow and serve you more largely.

We are very proud of the generous support given the paper the first year of our management by fruit growers of the entire nation. That proved we met a real need, and encouraged us to fill that need. We succeeded enough to give us ample reward for our efforts. But we are not satisfied. We are pushing on. We must grow!

Physically we have grown fast. We have increased the amount and variety of reading matter, the number and value of advertisements, the number of pages and pictures. With added decorations and a tinted cover, the AMERICAN FRUIT GROWER is not ashamed of its personal beauty. This issue finds our pages enlarged to standard size, the same as *The Country Gentleman*, *Green's Fruit Grower*, and *The Fruit Grower*, etc. This enlargement means added efficiency in every department.

EDITORIALS AND ARTICLES

Our policy has been to bring fresh, practical, and helpful information to the fruit grower every month. Our articles have been from men who know, both from study and concrete experience. Experts write them, whether about spraying or advertising fancy apples. The calendar of 1917 will find us giving you timely information on growing and selling fruit from associate editors in many states, experiment station experts, and contributors who know every branch of the fruit business.

"The Fruit Business"—that phrase sums up our editorial policy. We believe fruit growing is a big manufacturing and selling business; and it must have modern methods in all branches. The market end has been stressed because that right now is the important problem. Transportation, advertising, commission problems, sale management, labor—these are some of the things we have discussed, and shall discuss. We have tried to get the broad view, to work for better general conditions, in rural life, and to show our plain interest in big national questions. We are not political, but we fight for better political and economic conditions for the fruit-producer and farmer. Nor can we forget the ideal of a beautiful and happy country life for the family and the community.

NEWS

News is vital for progress. We trust that our services in announcing meetings, and recording the results of conventions and exhibitions; in printing crop and market reports and statistics; in digesting and discussing laws and current events in fruitdom; and in reporting the day's work of the industry, have proved valuable. To help fruit organizations, such as the State Horticultural Societies, the

Eastern Fruit Growers, and the new National Apple Growers, is a big and pleasant duty.

TO HELP THE READER

To help the average reader is our deepest wish. That will be our aim in the Departments, like those on "Motor Culture and Power," "Small Fruits and Poultry," etc. The Book Reviews will keep them posted on the latest theory and practice. The Letters and Questions Department will give anybody an opportunity to tell a discovery or amusing experience, to get help he needs on a puzzle, or to rise up in meeting to state what he thinks or opposes. More of our big fruit-growing family should help us and the brethren by writing to the AMERICAN FRUIT GROWER. It belongs to the readers.

Pictures have two great values. They tell how to do something better than pages of words; and they bring smiles and joy and beauty into printed pages. They have "human interest," and that's a big thing in fruit growing.

OUR ADVERTISERS

The editors and the readers should thank the advertisers. They make possible our efforts. They are also valuable to guide and save for our readers. They are worth while just as the news and editorials, and they are edited with the same care to exclude anything that might injure our big family in purse or life. They will give you a "Square Deal"—if for any reason they fail, let us know. In 1917 we shall print even more helpful advertising matter. Use it!

HOW YOU CAN HELP

Our record the first year is in your hands. Our hopes for the future are stated. We intend to stay and serve this great section. But we need your help. The cost of paper and all publishing expenses has increased, yet we have not raised our subscription price. We have faith that you need this journal of fruit growing so much you will support it. Frankly, we challenge any reader this full year to say the AMERICAN FRUIT GROWER has not been worth many times its cost. We believe one number will be worth that small sum.

Now if you want such a journal for your business interest, to help you save and make money, do the things: Take a personal interest in the paper and get a sense of partnership in its future success and growth. Send in your own subscription, new subscribers; give us the names of fruit growers. Buy from our advertisers, and mention the AMERICAN FRUIT GROWER when you write them.

Send us letters, pictures, question articles. We will pay for what we use. Correct us when we are wrong. Suggest new ways we can aid you. This very New Year shows us we are not perfect. But we can learn. The bigger, the franker, and the friendlier our family of subscribers, the more helpful our paper, the larger our opportunity.

We face the New Year with confidence and hope. To every fruit grower and farmer we send heart-felt wishes for prosperity, health, and happiness.

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DON'T HAVE A DORMANT SEASON

Trees have a dormant season, but they are busy getting ready for new growth. They are not really asleep. The fruit grower needs no "sleeping season." He may rest his muscles and machines; but the more time to use his brain and his books. Winter is the time for study, plans, and growth. We suggest the following matters for your thought this winter:

Politics. Study the laws that affect you. Think of the kind of man you want to represent you in county and state. Organize for action to get new laws that will help you and repeal old ones that hurt you. Don't wait till election day. The crook never sleeps.

Community Life. Investigate better schools, better roads, better health. Find out what you need and how much it will cost, and make a plan to get the money. Don't shut yourself off in isolation from neighbors. Meet with them for talks and plans. Import lecturers. Organize study clubs. Put life in your school league and farmers' club. Learn what other progressive communities are doing. Put some good books in circulation. Use your local newspaper to print letters and ideas. You'll be too busy later—are you too lazy now?

National Affairs. Rural progress depends on national progress. It is time you learned how vitally international policies, railroad legislation, the high cost of living concern you. What is the meaning of the war in Europe, of the Mexican trouble? What is the future of these United States? These great issues touch every citizen sooner or later, in pocket-book or happiness. They may look remote from the farm. But the farm must pay the price.

We do not mention plans for improving your own plant and income. You must attend to them! But if you neglect these other issues, your own plans are handicapped. The fruit grower who stands stock-still and does just the chores all winter is not dormant—he's practically dead. Are you a walking corpse?

ORCHARD OPINIONS

The farmer needs more preparedness if he is to help with preparedness.

Down in Mississippi they try taking the farmer to school at the State College by offering fine equipment and practical courses, with reduced railroad fares and low expenses. This is better than the traveling Institute or just one day.

Have you subscribed to good magazines and papers for the New Year? In these serious, changing times you need all the information you can get.

The United States needs some national coins—say, a two-and-a-half-cent piece, and a twelve-and-a-half-cent piece—the old Western bit. Then when the fruit growers and others get maybe a half a cent more for a product, the consumer wouldn't have to pay a whole nickel, which the producer never

Getting That Sales Manager

LEON WHIPPLE

That idea of "A Sales Manager for Every Orchard" urged in a recent number of the AMERICAN FRUIT GROWER struck home. All readers approved the plan. Some found in it a solution for many of our problems. But many, with the sound practical sense and skepticism that comes from facing hard facts in the country, wanted to know how it could be done. The theory was fine, but would it work?

I am tempted to answer that this same hard sense ought to know that nobody can tell whether a theory will work until it is tried. You can not give an ideal prescription about how to do a new thing in advance. The sales manager in a factory did not come ready-made and just waiting to be used at a profit. The manufacturer saw he needed somebody to sell his product. He took the best man available and put him on the job. They tried it out. They succeeded, and they improved the plan as they went along. Now there are plenty of sales managers.

Aren't we in about this position?

But this answer fits only the big orchard company. That can afford to get a good man, pay him a couple of years, and let him make his own place. Now what we want is a community sales manager who must depend on many small commissions for his salary. One correspondent puts it neatly: "A community would be unwilling to engage the services of a green man, and a man would be unwilling to fit himself for the position until he knew there would be a demand for his services in that special direction. This is something of a dilemma." It is—the only solution is to begin in a small way, and go ahead. The idea was to develop a manager at home, not import a trained man at big salary.

Practically in every fruit-growing community isn't there an honest, energetic, successful young fellow, of good business head, with a small orchard, or a local buyer, or a clerk or store-keeper with progressive ideas, or a young lawyer or doctor, country-bred, but with lots of spare time, or even a wide-awake school teacher? My experience says "Yes." Such a man knows the community, which is very important, and is known, even more important. He also has some ideas of fruit growing and fruit selling—he knows the problems, prices, and buyers. Let us assume that he has brains, energy, and ambition—otherwise he will never make a sales manager.

Now, suppose the first year, twenty-five progressive fruit growers contribute \$1.00 per month, beginning June 1st, to the salary of the Community Sales Manager. He would get a convenient location and have the use of a telephone. His duty would be to gather and arrange information on fruit growing and selling. He would get all government and state reports, experiment station bulletins, statistics on crop conditions

and probable markets. He would study his local crop and state and neighborhood crops. With help he should be able to estimate the barrels of various kinds in his vicinity in a rough way during the late summer. As a Central Bureau of Facts he would be worth that dollar a month to any grower just in saving time and postage and getting late and valuable data.

He might find it possible to make a trip or two to the big selling markets for his district. There he could learn from the commission men of their needs, what sort of pack and package they wanted, and the storage facilities and prices for the winter. He could, by mail or visit, learn about the direct sales to hotels, large grocers, and housekeepers. He might even advertise the apple crop if an extra appropriation were made.

Other things could be handled: the matter of freight rates and car supply, loading and the like. This would enable many an orchardist to put all his time on packing good fruit instead of spending hours on the road and at the freight station. The buying of supplies would be facilitated. Spray materials, barrels, and boxes, and the extras of packing might be bought through one man in a bulk that would mean a real saving to the faithful 25.

The actual sales would be made this year by the producers themselves, unless they wanted to employ the Sales Manager on a commission. Nobody would have to trust sales to "a green man." They would just profit by his data and advice for the small fee. He might, however, arrange for grouping small shipments to fill certain demands.

The next year such a man would be invaluable from the experience and information gained the first. He would still be paid a fee as Central Bureau man. Then the sales could be made on a commission basis, or the fruit could be grouped under some co-operative plan with this Sales Agent acting under a board of directors to get the best prices for the co-operators.

The net idea is to pick a man of ability, train him in the local needs, make him study the market and show his value, and give him either commission or salary enough to make it worth while. It will take some vision. But how can we even welcome the vaguest theory of a "Sales Manager for Every Orchard" unless we assume some vision and spirit of co-operation in the growers of the community?

We repeat that this young man, or old one, if it so happens you get a wise old business head, could be of great service as a general business agent to the country side. As notary, as superintendent of printing, as buyer and agent, as counselor on book-keeping and cost-finding, he might make himself invaluable. Our idea is that farming, and especially the marketing end, is a business proposition on which the farmer who is not

a business man needs advice. We predict that some day such Sales Managers and Business Advisors will be in every rural community working for the producer with information, ability, social spirit, and devotion.

THE TWO MAIN QUESTIONS

The two questions of first importance that confront the fruit grower are: First, marketing; second, use of by-products. The right method of growing and packing fruit is now fairly well understood, details may vary, but every grower has a good chance of raising first rate fruit if he avails himself of the knowledge at his command.

With marketing it is different. The only thing on which all growers are agreed is that the present conditions are unsatisfactory. They know that the grower gets too little in return for his labor and success, while the consumer pays too high therefor. Naturally when he thinks of the middle man he gets riled. Is it all the middle man's fault, and if so, what can be done about it?

It would be a most helpful thing if the two questions suggested could be thoroughly threshed out at the approaching horticultural meetings in each state. Those who arrange the programmes should engage speakers who will put forward the claims of every known or thought-of method of marketing, the ensuing discussion of differences of opinion will be as informing as the speech itself.

As for by-products, it is accepted that one of the first steps toward putting our business on a good footing is to keep the culls off of the market. What then shall we do with them? In many businesses the profit from what was once regarded as useless exceeds that from the original article. Let those competent to speak tell us what we can do in the way of making our culls return us something worth while without our breaking the market by dumping a lot of poor fruit upon it.

RID TREES OF CANKERS

Cankers on apple trees are due to various causes, such as infection from fungi in areas killed by pear blight, or in wounds caused by locusts or other injury, and the character of the canker may be determined by sending a sample to your State Experiment Station.

"There's a poor choice among rotten apples," and we do not care to take our pick of cankers, for whatever their particular characteristics they are all subject to the same cure—namely, cutting off and burning of the diseased limb.

Sometimes the affected portion can not be well spared from the tree, and, when this is the case, the whole affected area should be cut out well beyond the apparently diseased portion, and the wound should be treated in the same manner as where the limb has been removed, namely, disinfected and painted, or a wound paint of coal tar and creosote oil should be applied.

How About Your Sprayer?



DO NOT BUY A SPRAYING OUTFIT, without first writing for our **FREE Catalogue**. We have Bucket, Barrel and Power SPRAYERS in stock—Can Ship Quick, at any time.

Also ask us for prices on **Hydraulic Rams**, **Gasoline Engines**, **Artesian Wells**, **Water Supply Outfits**, **Wind Mills**, **Saw Mills** and **Severage Dispensers**

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Help you plan your plantings. Our free service and big berry book is yours for the asking.

No. 27—Townsend's 20th Century Catalogue, will not only help you to make your selections of plants this spring, but it will help you every day in the year. It is written by a Strawberry Specialist, and is brim full of valuable information, and is just the book every grower of small fruit needs.

The TOWNSEND NURSERY make a specialty of growing the finest strawberry plants grown anywhere in the world. Our nursery is situated on the Eastern Shore of Maryland, halfway between the Atlantic and the Chesapeake, a spot that has been noted for generations as the best place in the United States for growing hardy nursery stock. Townsend plants are grown right, and priced right, and are guaranteed to please you or money refunded. Send a postal to-day for our BERRY BOOK. If you only want a few strawberries for your garden or want to plant a field, we can help you.

At least you will want some of the ever-bearing strawberry plants. We make a specialty of this new race of berries, and could show you acres of plants just as good as the plant shown on the front cover of this paper last month. This plant was taken from one of our breeding plots and photographed for the AMERICAN FRUIT-GROWER. Our ever-bearing Progressives have a record of fruiting over one quart of berries per plant the first year plants are set. Our FREE book tells all about them.

E. W. TOWNSEND

40 VINE STREET

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Turn Apple Waste to Profit



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A STITCH IN TIME

In fruit growing as in most other things it pays handsomely to be on time. How many fruit growers have watched with sorrow their crop of fine fruit deteriorating because they failed to order the proper containers on time, and, when their order was sent, the rush season was on and a costly delay ensued.

In spraying it is even more important to be prepared beforehand with plenty of spray materials. The day you find out that your orchard

is in need of spraying is the very day on which you ought to begin spraying. If you are not supplied with the materials you lose immensely valuable time—the infection spreads in your orchard, and it requires more work to give a less satisfactory result than it would have had you been able to jump right in and check the infection.

Is your wife a partner—or a hired girl without wages?

1917! It sounds like a lucky year! May you have your share!

CREAM SEPARATION

D. E. Andrews, Manager Sharples Separator Company, has written a leaflet on cream separation. Every family that is considering investing in a separator is interested in the facts discussed in this leaflet, which will be furnished free on application in the desired quantities to school teachers, agricultural teachers, county agents, creamery managers, etc.

Any one who may be interested in such a treatise for educational purposes, should send a request for the desired number of leaflets to the Dairy Educational Department of the Sharples Separator Company, West Chester, Pa. Subjects discussed are: "Is it Advisable to Sell Cream or Whole Milk?" "Comparison of Systems of Skimming," "The Use of the Separator," "Conditions Affecting Separator Efficiency."—Advertisement.

THE COST OF WIRE FENCE

Much has been said and written about the cost of wire fence. But after all, cost depends just as much upon the number of years of service a fence gives as it does upon the original cost of the fence. Far-sighted farmers figure that if a fence costs 30c per rod and lasts 15 years, the cost is 2c per rod per year. If the fence costs 28c per rod and lasts 10 years, the cost is almost 3c per rod per year. By spending only 2c per rod extra at the start, it would mean, in the above case, that you would get 5 years more service.

This is not an argument for high prices. On the contrary it is intended to urge you to buy more carefully this year than ever, so as to get the benefit of every possible saving. We suggest that you study values more carefully—get the various fencing catalogues and decide which fencing to purchase, only after you have given the matter your earnest consideration.

One catalogue you will, of course, want to have, is that issued by The Brown Fence & Wire Co., of Cleveland, Ohio. It illustrates and describes over 150 styles and sizes of double-galvanized woven wire fence, from 13c per rod up, freight prepaid. It also shows a complete line of lawn fences, lawn gates, field gates, steel posts, barb wire, etc. A post card request addressed to Jim Brown, Pres., The Brown Fence & Wire Co., Dept. 91, Cleveland, Ohio, will bring this beautiful 80-page book by return mail. We suggest that you write at once while the present low prices are in effect.—Advertisement.



Giving the summer spray with a single hose barrel sprayer. Excellent results can be obtained with this machine, and where labor is cheap many growers prefer the hand operated type.

INSURE YOUR FRUIT CROP

Intelligent Spraying Will Do It

The time has passed when it is necessary to ask "Does It Pay To Spray?" Every orchardist knows that he must spray or get out of business. The San Jose scale has settled that once for all. But the San Jose scale has been a blessing in disguise enforcing thorough care of fruit trees. And the modern orchardist who is equipped with proper spraying tools is more prosperous than ever.

Thousands of orchardists trace their success, in part, to the powerful and efficient sprayers furnished them by the Goulds Manufacturing Company. This concern has had over 65 years' experience in pump building, and has reduced sprayer construction to an exact science. The Goulds line includes hand and power sprayers for every orchard and garden need. No matter whether you have a large commercial orchard or only a few bushels in the garden, there's a Goulds sprayer that will exactly fit your needs. From the great engine-driven "Dreadnought" to the handy knapsack sprayer the line is complete.

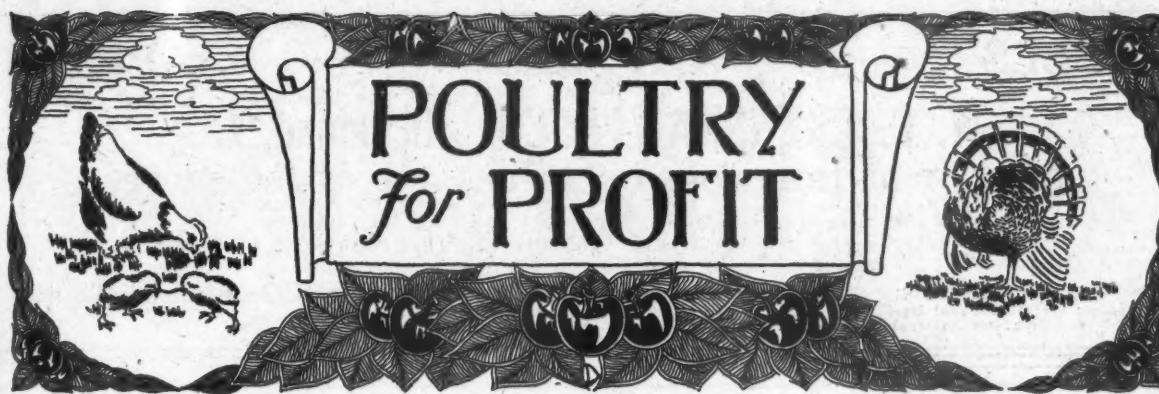
Our book illustrates and describes them all. Gives some valuable spraying hints, too. It

should be a part of your working library. "First, plan your work, then, work your plan" is the recipe for success in fruit growing. And these long winter evenings are the ideal time for planning.

There's a lot to learn about sprayers and sprayer construction. And the better you understand this subject the better you will do your job of spraying next spring. No time then to pore over catalogues—every minute will be needed for action.

Another point, the Goulds staff of trained engineers are at your service, and will be glad to advise you on any spraying problem. You may think your problem is "different," but it can usually be readily solved by the application of Goulds training and Goulds experience.

Our book, "Goulds Hand and Power Sprayers," is free. Send for it. Study it; ask us all the questions you like. You will thus lay the foundation for big crops of fancy fruit—the kind that top the market. Write at once, before you forget. Address: The Goulds Manufacturing Company, Seneca Falls, N. Y.—Advertisement.

ROBERT FAIRFAX, *Editor*

The New Year dawns on a world saddened and, let us hope, chastened, by the ravages of war and sorely perplexed over the problem of getting enough to eat. A grave shortage of food products is said to exist. At any rate prices are unprecedently high, and everybody is complaining. Wages in all lines are rising, and still the cry goes abroad that food is too dear. Various relief measures are proposed.

Congress is urged to act in favor of an embargo on grains, the daily press is reporting various voluntary measures to force down the price of food products, the most dramatic of which is the boycott against eggs. Cold storage eggs have been going into consumption at 42 cents retail, while fresh gathered have brought as much as 75 cents retail.

Effect of Boycott

These prices, however, are just as mysterious to the producer of eggs as they are to the consumer, for 40 cents in trade is the top price producers have received at the country store. The boycott has lowered the price to 36 cents. Cold storage eggs are now selling at 35 cents retail, the price that the boycotters' predetermined. Presumably city consumers will now return to contentment, having won the fight for lower prices. Their gain is the farmer's loss. Jobbers and retailers have sacrificed nothing. Poultry for profit is a sure thing with them.

An interesting incident of the boycott business appears in Kentucky. The Louisville boycott against butter and eggs was very well managed, and the price of country produce was forced down to about the usual levels. Farmers supplying that market are now discussing the advisability of putting in a boycott against Louisville products. The plan is to refrain from buying anything manufactured or handled in Louisville. Query: Will the people of Louisville enjoy taking their own medicine? Would the people of any city welcome a boycott by the surrounding population?

It begins to look as if city people are going too far with the boycott business. There are times, of course, when expenses must be cut down, but why is it when such times come that people generally turn their attention to the grocery bill? Why single out eggs and organize a campaign of abstention, but keep right on buying things less necessary at constantly ascending prices without active protest? I have not heard of any boy-

cotts against the high prices for clothes, millinery, automobiles, and the like. But what a lament over the high cost of eggs!

Why Eggs Are Scarce

The poultry situation is so unusual that I can not refrain from calling attention once more to certain primary truths at the basis of profitable poultry keeping.

The high price of eggs is due, of course, to limited production. But what are the leading factors of this limited production? In other words, why do not farmers have eggs to sell when the selling is good? There are several reasons.

In the first place, all hens, both farm and city bred, are at or near the lowest point of production. Moulting hens do not, and can not lay many eggs. And this is the close of the moulting season. As farm flocks are largely composed of hens, farmers consequently gather only a few eggs during the period of high prices.

In the second place, most pullets brought through the season were late hatched, that is, May and June hatched. If such pullets are not given the very best care they simply do not reach laying maturity in time to commence laying before cold weather. As most of the fall and early winter eggs come from the pullets, and as pullets of laying maturity by late fall are very scarce on the average farm, it ought not to be difficult to understand why farmers and fruit growers have so few eggs to sell when eggs are bringing high prices.

Egg-Producing Foods

In the third place, farm poultry generally does not receive a balanced ration. The fowls get plenty to eat, no doubt, but it is not graduated to the point of egg production. Corn is one of the best grains, the very best, I believe, but corn alone will not produce eggs. Laying hens and pullets must have egg-producing foods, as well as body-producing foods. Among such are bran, middlings, alfalfa meal, cotton seed meal, meat scrap. Green stuff is also essential to the best results—ripe apples, turnips, cabbage, sugar beet. Silage will help. There is no magic about this. The hen proves her own ration by production.

When poultry plans for the season are under consideration, do not forget the shortage of eggs for the market basket during the period of high prices, 1916-17. Remember, and again I say, remember, that most of the HIGH-PRICED eggs are laid by

the EARLY-HATCHED pullets. Feeding is a factor, housing is another, but first of all you must have the mature pullets by October first. It is not too early to commence work on hatching plans. Have you any special problems? If so, do not hesitate to write to the AMERICAN FRUIT GROWER.

"BARREL MAKING SIMPLIFIED"

An Instructive Volume on Barrel Making
Includes Cooperage Information, A long-needed book by the Grower and Manufacturer.

Price \$1.00

TESTIMONIALS

UNIVERSITY OF MISSOURI COLUMBIA

Department of Agriculture

Mr. Leon Miller, Philadelphia, Pa. May 11, 1914.

My Dear Sir:—I want to acknowledge with thanks the receipt of a copy of your "Barrel Making Simplified." You have gotten out a very serviceable and very attractive booklet. The descriptions and excellent cuts make it perfectly plain how to make a barrel. In my judgment, it should be of interest to apple-growers.

Very truly yours,

J. C. WHITTEN.

VIRGINIA AGRICULTURAL EXPERIMENT STATION

Mr. Leon Miller, 1952 Germantown Ave., Phila., Pa. Blacksburg, Va., May 23, 1914.

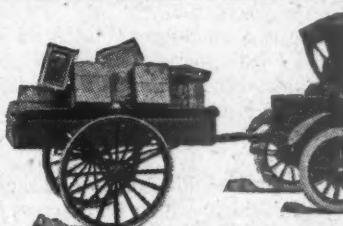
Dear Sir:—I have your letter of the 22d inst. inquiring my opinion of your booklet which you sent me recently. I have looked it over and find it contains a good deal of useful information for the man who may be thinking of making his own apple barrels. I have had barrels made in my own orchard for two years, and find it quite a saving as compared with purchasing them at the factory.

Yours very truly,

S. W. FLETCHER, Director.

LEON MILLER

1952 Germantown Ave. Philadelphia



Make Your Auto Earn Its Living

Make it haul your farm products to market, and other things from place to place by hitching to it my

HANDY AUTO TRAILER.

Hauls up to 500 and 1,000 lbs. of farm products or anything else without extra cost. Makes your car profitable as well as pleasurable. Write for description and prices. Agents wanted. Write for territory.

E. B. ROGERS
120-A Millville Ave., Hamilton, Ohio

Ground Limestone

Guaranteed 90 per cent
Calcium Carbonate

Carload lots in bulk, \$1.00 per ton.
Carload lots in second-hand burlap bags, \$2.00 per ton.

Carload lots in bags furnished by customer, \$1.25 per ton.

Less than carload lots, \$2.50 per ton.

Special low freight rates on carload lots on all leading railroads in Virginia and adjoining States; 100 miles, 60¢ per ton; 200 miles, \$1.00 per ton; to Petersburg, Va., 282 miles, \$1.10 per ton; to Norfolk, Va., 360 miles, \$1.25 per ton, and to Washington, D. C., Baltimore, Md., and all intermediate points, \$2.21 per ton.

Write for other rates and information.

W. F. CULBERT
Marion, Va.

SPRAY For Perfect Fruit and Vegetables

The Junior Leader

has a 2-H.-P. gasoline engine and a 3-plunger pump, both assembled on a steel plate to prevent getting out of alignment.

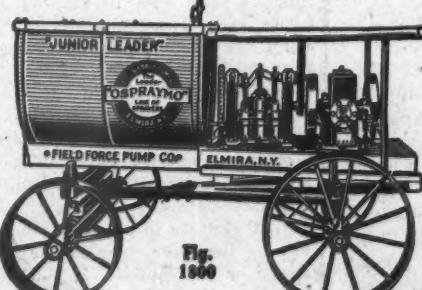


Fig. 1800

Engine can be used for other power purposes. Tank holds 150 gallons. Keeps 6 nozzles going at high pressure.

Automatic Agitation of liquid. Suction strainer is brushed clean.

Call and see ours and secure copy of **handsome** Spray Book.
Also headquarters for Spray Material, Hose and Pump Fixtures

CHARLOTTESVILLE HARDWARE CO., Agents

FIELD FORCE PUMP CO., Manufacturers

Elmira, N. Y.

Kindly mention American Fruit Grower when writing to Advertisers

FREAKS AND FAKES

The horticultural stations are often amused by the cases of "freak" fruits brought to their attention. It is not unusual for them to receive statements as to the possibility of a grapevine bearing an apple or a gooseberry growing on a peach tree.

Those who make these claims do so in good faith—for have they not seen with their own eyes something that looked like a gooseberry on their own peach tree, and is not "seeing believing"?

The scientist knows that while there is a wide field in which fruits cross it is also definitely limited. Almost all orchardists now know that the bearing of an apple tree is increased by cross-pollination. Some varieties will not bear at all without this, and that is why we must study which varieties should be planted in adjoining blocks so that they may profit by the pollen from the kind that gives the best results. No effect is noticeable in the appearance or flavor of fruit so produced, but if the seed from such fruit is planted the resulting tree will be quite different from what it would have been if the seed of a self-pollinated tree of either variety had been planted.

"Even closely related fruits like apples, pears, and quinces may grow side by side all their lives and yet no crosses will occur," says Professor Howard, of the University of Missouri. He further tells us that it is rare for separate species to cross pollinate however closely related they may be.

FALL ORCHARD CLEANING

For housewives the spring house-cleaning is proverbial, and the fall orchard-cleaning should be equally so for the orchardist. Don't leave your orchard in a clutter after the harvest, but see to it that the trees go into the winter cleared of all mummied fruit (which should be removed and burned), that the orchard rows are clear of the left-over tools of the harvest—which should be sheltered through the bad weather coming—and be sure that all ready-made homes for mice and rabbits are destroyed.

You know what places they like to winter in—dry grass, weeds, brush—see that this is taken away. It harbors disease germs as well as the destructive rodents. A clean orchard will not carry over infections from one season to another.

This year has seen an unusually heavy infection from apple-scab, bitter rot and other enemies of fruit. Unless some good orchard cleaning is done now these troubles will reappear next season. Protect your young trees from mice and rabbits with wire netting, wooden veneer paper wrappings or other device for defence. The homely saying that "a stitch in time saves nine" is nowhere more true than in the orchard.

PEACH & APPLE TREES 2c & up

Pear, Plum, Cherry, Small Fruits, Strawberries, Vines, Nuis, etc. GENUINE MALE BUDDED from Bearing J. H. MALE TREES. GENUINE DELICIOUS APPLES. Write for free catalog.

TENN. NURSERY CO., Box 24, Cleveland, Tenn.

APPLES APPLES APPLES

W. C. CRENSHAW & CO., Richmond, Va.
CAR LOT DISTRIBUTORS OF APPLES AND OTHER FRUITS

We make a specialty of Virginia Apples. Can handle any quantity of Apples and get results. TRY US AND BE CONVINCED.

References: National State and City Bank.
First National Bank.
Broadway National Bank.

W. C. CRENSHAW & CO., Fruit Distributors
Richmond, Va.

Renew Your Health
At Nature's Fountain

Without the Expense and
Loss of Time Necessary
for a Visit to the Spring

THE CRISIS

There comes a time in the life of practically every man and woman when their digestive or eliminative organs, or both, fail to respond to drugs prepared by human skill. In fact drugs seem to do them about as much harm as good, for their systems rebel against all drugs. These are the cases which physicians call "stubborn" and "chronic" for the reason that they persist in spite of drug treatment. I do not refer to incurable diseases, such as cancer and consumption, but to that larger class of functional disorders which we meet every day, where the organs of digestion and elimination are impaired.

For this class of cases our best physicians and our big city specialists send their *wealthy* patients to the mineral springs where, in the great majority of cases, they are permanently restored or decidedly benefited. But what about the poor man who has not the money or the busy man or woman who can not spare the time to spend several weeks or possibly months at a health resort? Shall circumstances deny them the restoration to health which Nature has provided? Read my answer in the coupon at the bottom of this page.

I have the *utmost* confidence in the Shivar Mineral Spring Water, for to it I owe my Restoration to Health and probably my Life. It has made me tens of thousands of friends in all parts of America, and even in foreign countries, whose faces I have never seen. Yet I count them *my friends*, for the Shivar Spring Water has bound them to me by lasting gratitude.

I ask you to read their letters, a few samples of which I publish herewith for your benefit, and if you find among them any encouragement as to your own health do not hesitate to accept my offer, which has no limits or conditions except those shown on the coupon. If you could read the letters that come to me daily, numbering about ten thousand a year, and the vast majority of them similar to those printed herewith, you would not wonder that I make this offer, displaying my *absolute confidence* in the restorative powers of Shivar Mineral Water.

INDIGESTION

I was suffering with indigestion, stomach and liver disorders and all its train of horrifying phenomena for several months. I had lived on milk, soft eggs, shredded wheat, a very insufficient diet for an active working man, and, of course, from disease and starvation was in a very low state of nervous vitality and general debility. I ordered ten gallons of your Mineral Water, which I used continuously, reordering when necessary, and in four months gained twenty-nine pounds, was strong and perfectly well, and have worked practically every day since. It acts as a general renovator of the system. I prescribe it in my practice, and it has in every instance had the desired effects. It is essential to use this water in as large quantities as possible, for its properties are so happily blended and in such proportion that they will not disturb the most delicate system. It is purely Nature's remedy.

A. L. R. AVANT, M. D.

I feel it my duty to suffering humanity to make public announcement of the benefits I have derived from Shivar Spring Water. I have been a sufferer for the past twenty-five years from indigestion and dyspepsia. After one week's trial of Shivar Water I commenced to improve, and after drinking it for four weeks I gained fifteen pounds. I feel better and stronger than I have in twenty-five years. I strongly recommend this Water to any one with stomach trouble of any character, and truly believe it will cure ulcer of the stomach. I am writing this voluntarily, and trust it will fall in the hands of many who are so unfortunate as to be afflicted with indigestion and nervous dyspepsia.

C. V. TRUITT,
President Unity Cotton Mills.

DYSPEPSIA

For many years I suffered with stomach trouble as a direct result of asthma. I consulted the very best specialist in this country, and spent quite a large sum of money in my endeavor to get relief. However, I had about come to the conclusion that my case was hopeless, but by accident I happened to get hold of one of your booklets, and decided to try Shivar Spring Water. After drinking the water for about three weeks I was entirely relieved, and since that time have suffered but little inconvenience from my trouble. I cheerfully recommend the use of your Water to any one that may be suffering from stomach trouble.

OSCAR T. SMITH,
Vice-Pres. Young & Selden Co.,
Bank Stationers.

FILL OUT THIS COUPON AND MAIL TO-DAY

Shivar Spring,
Box 44T, Shelton, S. C.

Gentlemen:—I accept your offer, and enclose herewith two dollars (\$2.00) for ten gallons of Shivar Mineral Spring Water. I agree to give it a fair trial in accordance with the instructions which you will send, and if I derive no benefit therefrom you agree to refund the price in full, upon receipt of the two empty demijohns, which I agree to return promptly.

Name _____

P. O. _____

Express Office _____

Please write distinctly.



Trade Mark Registered

RHEUMATISM

I have tested your Spring Water in several cases of rheumatism, chronic indigestion, kidney and bladder troubles, and in nervous and sick headaches, and find that it has acted nicely in each case, and I believe that if used continuously for a reasonable time will produce a permanent cure. It will purify the blood, relieve debility, stimulate the action of the liver, kidneys, and bladder, aiding them in throwing off all poisonous matter.

C. A. CROSBY, M. D.

I suffered with indigestion and kidney trouble, and a year ago was stricken with acute articular rheumatism; was helpless for months, and since using your Spring Water I am walking without any crutch, and improving daily. Indigestion much relieved. I wish I could write Shivar Spring Water in the sky so that the world could become acquainted with it. MRS. THEO. KUKER.

BILIOUSNESS

For over two years, following a nervous breakdown, I have suffered with a liver so torpid that ordinary remedies were absolutely powerless. Under such circumstances I came to Shivar Spring, and began drinking the Water. Upon advice, however, the first night I took a laxative; the second night a milder one. Since then I have taken none at all. The effect of the water has been remarkable—its action on my liver most marked, and my health and spirits greatly improved. I am satisfied that the laxative, followed by the Water, was the proper treatment in my case. My condition is now perfect.

S. A. DERIEUX.

It is a great pleasure to tell you that your Water has been a great benefit, I may say a great blessing, to me. My wife says it has helped me more than anything else I ever tried. I have been, for thirty years, a sufferer from stomach trouble.

BBV. E. H. ROWE,
Co-President Southern Seminary.

RENAL AND CYSTIC

I suffered for eight years with kidney trouble and inflammation of the bladder to the extent that I would have to get up during the night some five or six times. After using this water only a few days, I am entirely relieved, and suffer no more effect of the trouble whatever.

J. P. D.

My wife has had a bad kidney trouble for several years. She has been using the water only about three weeks, and it has already made her a new woman. Her color is much improved, her appetite is all that she could wish for, her digestion seems to be perfect. We give Shivar Springs credit for it all.

T. G. S.

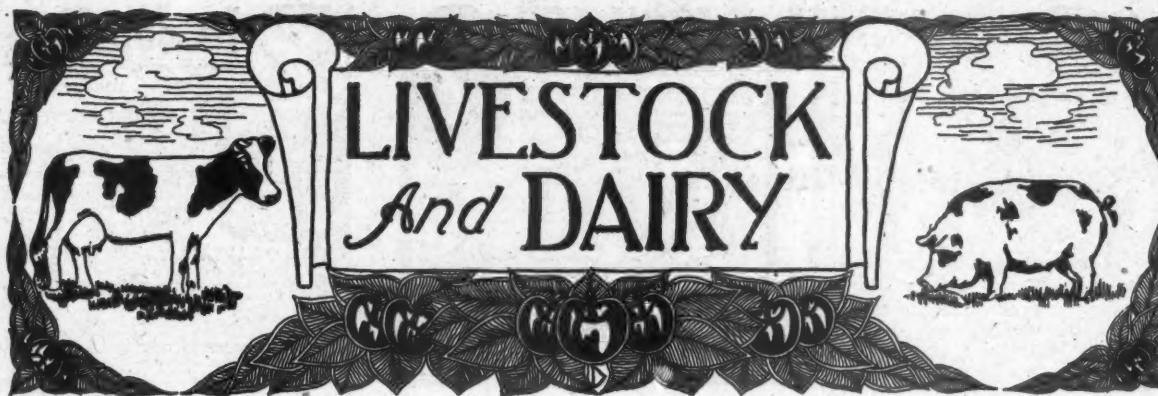
GALLSTONES

Shivar Spring Water cured my mother of gallstones, or, I might say, it snatched her from the hospital door, as the doctors had said nothing short of an operation would do her any good. After drinking the Water she was able to get out of bed, and is to-day stout and healthy. I hope these few lines will be of help to some one suffering as my mother did.

W. J. STRAWN.

My doctor said I would have to be operated on for gallstones, but since I have been drinking your water I haven't had to have a doctor.

W. H. EDWARDS.



TO CONTROL HOG CHOLERA

1. Cholera may come in any herd not protected.

2. Cholera kills more hogs than all other diseases combined.

3. Cholera is easily spread by streams, dogs, stray hogs, visitors, and utensils moved from one hog lot to another. Also by visiting public stock yards, and by infection carried over in pens from previous outbreaks.

4. Cholera can be largely prevented by burning carcasses of dead animals; disinfecting houses and troughs with compound cresol, one part to water 30 parts; removal of litter to fields; liming yards; filling or draining wallow holes; liming under buildings where hogs run.

5. Confine sick hogs. Find out the cause of sickness early.

6. Post quarantine notice, HOG CHOLERA—KEEP OUT.

7. Notify the neighbors so they can take notice and prevent the disease becoming an epidemic in the community.

8. Immunize the well and stronger hogs with the serum process, but do it early if good results are to be expected.

9. Kill and burn all hogs which do not completely recover. They may carry and spread infection for a long time.

GOOD POTATO SEED SCARCE

Potato growers must face an unusual situation in the spring of 1917. Not in many years have good seed potatoes been so precious. Hit and miss methods must be abandoned, and every seed eye must be made to do its utmost. The Iron Age Potato Planter illustrated below has been designed to drop one piece in every hill, but never to drop two pieces in the same hill. It has fairly earned its title—"The 100% Potato Planter." It will save 10 to 20 bushels of seed on a 10-acre field, and assure a better stand.

Besides, 100% planting—a piece in every hill—will increase the yield from 5% to 10% above what would ordinarily be secured. With an average yield of 150 bushels per acre that means 7½ to 15 bushels extra per acre—75 to 150 bushels extra from a 10-acre field.

Yes, "The 100% Potato Planter" saves on seed and increases the yield. It's a mighty good investment any season, but this year it is practically a necessity. Better look up the manufacturer's advertisement in this paper.—Advertisement.



Making the Most of High-priced Potato Seed

LIVESTOCK And DAIRY

10. Cholera can be controlled by disinfection, quarantine and vaccination. Do your part. Keep cholera out of your community. It is too late when cholera is everywhere.

MILK SUBSTITUTE FOR CALVES

Nothing is better than milk on which to raise thrifty, growing calves, whether they are intended for the dairy, the feed lot or the show ring. The ordinary farmer often finds milk too expensive as a calf feed. The following substitute is recommended by the Massachusetts Experiment Station: Twenty-two pounds ground oats, 10 pounds linseed meal, 5 pounds middlings, 11 pounds fine corn meal, 1½ pounds fine blood meal, ½ pound salt. Total cost, 3 cents a pound.

Prepare by adding one-half pound of meal to two quarts of boiling water for each feed. At each feeding moisten the meal first with a little cold water to prevent it forming lumps, and then pour on the boiling water, and stir well. When this is cooled down to the temperature of milk fresh drawn from the cow it is ready to feed.

It is better to let the calf have whole milk for about a week, then gradually introduce a little of the milk substitute for ten days or two weeks, when you can cut out the milk entirely.

As soon as the calf will eat, let it have hay and a little of the meal dry,

together with fresh water. Always have the calf meal mixture milk-warm when fed. Have the buckets clean, and do not overfeed. A young calf will usually begin to eat hay at about three weeks old.

Glass Cloth A transparent water-proof fabric guaranteed to generate about the same warmth and light as glazed sash, or money back. For all forcing purposes. Sample 3 x 8 ft., 50c, prepaid.

Tree Protectors—Plant Forcers
TURNER BROS., Dept. C., Bladen, Neb.

I WANT EVERY READER OF THE AMERICAN FRUIT GROWER to read my 16-page booklet, "WHAT YOU SHOULD KNOW ABOUT THE BARREL." It's FREE to Fruit Growers. Send a card for your copy to-day.

LEON MILLER
1952 Germantown Ave. Philadelphia

IRON AGE

Farm, Garden and Orchard Tools
Answer the farmer's big questions: How can I grow more crops with least expense? How can I cultivate more acres and have cleaner fields?

IRON AGE Riding Cultivator

will help you do this. Has pivot wheels and gangs with parallel motion. Adjustable to any width of row. Every tooth can be raised, lowered or turned to right or left. Never adjust balance of frame to weight of driver. Light, strong and compact—the latest and best of riding cultivators. We make a complete line of potato machinery, garden tools, etc. Write us today for free booklet.

Bateman Mfg Co., Box 9D, Grenloch, N.J.



"Selecting and Developing the Jersey Herd"

Is a booklet by Prof. Hugh G. Van Pelt. It tells how you can build a well-developed, money-making Jersey herd by proper selection and judicious breeding. The future of your dairy herd depends upon how you select your foundation animals and how they and their offspring are developed. The Jersey cow combines beauty with dairy conformation. Healthy, vigorous and profit-producing, she lifts the mortgages and increases bank accounts. Send for book today.

American Jersey Cattle Club
313 West 23rd St. New York City

Let the Silo Buy the Auto



If your problem is to decide between the silo and the auto, better get the silo first. The silo will help to buy the auto; but you can never make the auto buy the silo.

A Natco glazed hollow tile silo will add 40% to the value of your corn crop. Results—bigger cream or milk checks and reduced feed bills. Build a

Natco Imperishable Silo

"The Silo That Lasts for Generations"

Stoutly reinforced with steel bands laid in mortar. Simple in design; only two shapes of tile used; any mason can erect a Natco. Wind-proof, decay-proof, fireproof and frost-resisting. Needs no painting—has no hoops to tighten. Used and endorsed by leading Experiment Stations. Fully guaranteed. Will greatly increase the cash value of your farm.

Send for our Silo Catalog—also our book, "Natco on the Farm," describing all kinds of farm buildings built with Natco Hollow Tile. Tell us what you're going to build. We have many farm building plans to submit, and will help you solve your building problems, free. Write today.

National Fire Proofing Company

1158 Fulton Building
Pittsburgh, Pa.

23 Factories—Short Hauls—
Prompt Shipments



A Natco Silo and a Natco Hollow Tile Barn mean permanent prosperity

ALFALFA HAY FOR HOGS

A few years ago the idea of feeding hay to hogs would have been considered preposterous and impractical. With the advent of alfalfa, came the suggestion that since it was a feed as high in protein content as most of the grains it might be used to a considerable extent in replacing grain as a feed for hogs. Alfalfa has been used extensively as a pasture for hogs, and is one of the very best pasture crops for hogs. As to its value as winter feed in the form of hay, farmers generally have been in doubt and slow to take up the use of it.

During a trial at the North Dakota Experiment Station alfalfa hay was fed in the whole or uncut form in cheap racks provided for the purpose. These racks were made with the upright slats about eight inches apart, or just close enough so that the sows could not get their heads completely into the racks.* In this way they would have to pull the hay from the racks slowly, a little at a time, and they wasted very little of it. These racks were placed along the fences in protected places out of doors.

Close observation of the sows during the winter months and during the

month of March while they were farrowing leads to the following conclusions:

1st. It was possible to replace one-third of the grain ration for brood sows with alfalfa hay.

2d. It required 1.04 pounds of alfalfa hay to replace one pound of grain.

3d. The feeding of alfalfa afforded an excellent means of getting the sows to take more exercise than they do when fed grain alone.

4th. No trouble at all was experienced by any of the sows in farrowing.

5th. The sows fed alfalfa hay farrowed just as large, strong, and uniform litters of pigs as did the sows not receiving it.

6th. The sows fed alfalfa appeared to milk better and nurse their pigs a little better than did those not receiving hay.

7th. The results obtained in this trial indicate that it is practical and advisable to feed as much alfalfa hay to brood sows in winter as they will eat, regulating the additional grain ration so as to keep the sows in proper condition.

FOR SALE

ORCHARD—21 acres; peaches and apples; planted alternately; five years old. Situated in fruit section; two and three-fourths miles from B. & O. station. Price, \$3,500. A paying proposition.

C. W. CUNNINGHAM

Paw Paw

West Virginia

FOR SALE

ORCHARD—At Hancock, Md., half mile from National Pike; 81 acres superior fruit land; five thousand peach trees, first crop this year; other fruit; quality was extraordinary. Complete equipment. Owner disabled. Real bargain. Address

ORCHARD

Care of American Fruit Grower

GOOD SEED MOST ECONOMICAL

This year above all others, the trucker and gardener should be extremely careful where he buys his seeds. Not in many years has good seed been so scarce. Consequently the temptation is unusually strong to market seeds of inferior grade.

There are, however, firms who value their long-established reputation for fair-dealing far too much to sell anything but high-grade seeds at any time. AMERICAN FRUIT GROWER readers will find such firms advertised in these pages. They are trustworthy—patronize them.



A Field of Onions at the Seed Farms of J. J. H. Gregory & Son, Marblehead, Mass.

We would call especial attention to one firm, J. J. H. Gregory & Son, which has a 61-year record for honorable dealing. Its seed farms are the most extensive in the State of Massachusetts. The seeds offered you by this firm are, for the most part, grown upon its own farms from selected stocks. No pains are spared to keep all varieties true-to-name and at a high standard of vigor and productiveness. Such seeds are worthy the title of "Gregory's Honest Seeds." You can rely upon them.

We suggest that you look up the advertisement of this firm in this issue and take advantage of the special offers they are now making. Remember, good seeds are scarce and supplies will be early exhausted. Secure yours NOW.—Advertisement.

Have a Neighbor

who would be benefited by reading the AMERICAN FRUIT GROWER regularly; and I believe he ought to be a subscriber. Send him a sample copy, and tell him it was sent at my request.

His Name is _____

His Address is _____

My Name _____

My Address _____

We will gladly send a free sample copy to prospective subscribers. If you have more than one friend, send a list on a separate sheet of paper.

MAIL THIS BLANK TO AMERICAN FRUIT GROWER, CHARLOTTESVILLE, VA.



IRON AGE GARDEN TOOLS

Answer the farmer's big question: How can I have a good garden with least expense? How can the wife have plenty of fresh vegetables for the home table with least labor?

IRON AGE Combined Hill and Drill Seeder

solves the garden labor problem. Takes the place of many tools—stored in small space. Sows, covers, cultivates, weeds, ridges, etc., better than old-time tools. A woman, boy or girl can push it and do a day's hand-work in 60 minutes. 38 combinations, \$3.25 to \$15.00. Write for booklet.

Bateman Mfg Co., Box 9C, Grenloch, N.J.

Indoor Closet

More Comfortable, Healthful, Convenient

Eliminates the out-door privy, open vaults and cold places which are breeding places for germs. Have a warm, sanitary, odorless toilet right in your house. No going out in cold weather. A boon to invalids. Endorsed by State Boards of Health.

ABSOLUTELY ODORLESS

Put It Anywhere In The House. The germs are killed by a chemical process in water in the container, which you empty once a month. **Absolutely no odor.** No more trouble to empty than ashes. Closet absolutely guaranteed. Write for full description and price.

ROWE SANITARY MFG CO. 1010A ROWE BLDG., DETROIT, MICH.

Ask about the Ro-San Washstand—Hot and Cold Running Water Without Plumbing

Spraying Results Guaranteed

Liberal Offer No Fruit Grower Should Miss

Here's proof-positive of our unbounded confidence in "SCALECIDE" as the most effective dormant spray. We will make the following proposition to any reliable fruit grower:

Divide your orchard in half, no matter how large or how small. Spray one-half with "SCALECIDE" and the other with Lime-Sulfur, for three years, everything else being equal. If, at the end of that time, three disinterested fruit growers say that the part sprayed with "SCALECIDE" is not in every way better than that sprayed with Lime-Sulfur, we will return the money you paid us for the "SCALECIDE." Could anything be fairer? Write today for full particulars.

B. G. Pratt Co., Mfg Chemists, Dept. 40, 50 Church Street, New York

TREES!

TREES!

TREES!

FOR FALL 1916, OR SPRING 1917

100,000 APPLE TREES

75,000 PEACH TREES

Leading commercial varieties. Our trade is very largely with Virginia and West Virginia orchardists. Catering to their needs, we, of necessity, have suitable varieties for these sections. Write for list of varieties we offer. Submit your memorandum of wants for best prices. We grow all classes of trees, both FRUITS AND ORNAMENTALS.

PROMPT FREIGHT DELIVERY OVER ALL RAILROAD LINES

THE MOUNTAIN VIEW NURSERY CO.

WILLIAMSPORT

MARYLAND

Fruit Packages of Every Description

BERRIES—

Gups
Crates

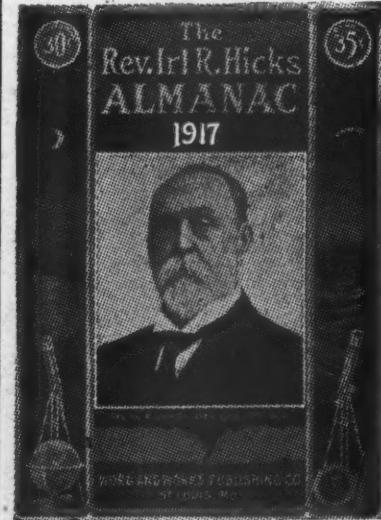
PEACHES—

Baskets, Crates,
Carriers, Tills

APPLES—

Boxes
BasketsPAPER BOXES OF ALL KINDS
ROUND AND SPLIT BASKETSCHARLOTTESVILLE BOX AND BASKET CO., Inc.
CHARLOTTESVILLE, VIRGINIA

THE GREATEST WEATHER PROPHET



reading matter. The subscription price of WORD AND WORKS to each annual subscriber, is \$1.00. We will send WORD AND WORKS one year with a copy of THE HICKS 1917 ALMANAC and the AMERICAN FRUIT GROWER for \$1.05. This is a great bargain in reading matter for 1917, and we hope our readers will avail themselves of the offer.

Word and Works

This fine monthly magazine contains not only Rev. Irl R. Hicks' forecasts of the weather each month, but much other interesting scientific and family

reading matter. The subscription price of WORD AND WORKS to each annual subscriber, is \$1.00. We will send WORD AND WORKS one year with a copy of THE HICKS 1917 ALMANAC and the AMERICAN FRUIT GROWER for \$1.05. This is a great bargain in reading matter for 1917, and we hope our readers will avail themselves of the offer.

Kindly mention American Fruit Grower when writing to Advertisers

LUTHER SUTTON, *Editor***Varieties to Plant**

In discussing this subject the writer asks the readers of the AMERICAN FRUIT GROWER to remember that varieties do not behave the same on all soils, hence some of the varieties mentioned may not prove desirable in all places.

By the time this issue reaches the readers, those interested in growing berries and grapes should be planning the next season's work. Early planting is very important with most of the small fruits. Unless they get established before the hot, dry weather very unsatisfactory stand and growth may be expected. The nurserymen generally fill orders in the order in which they are received, and first there first served. Get the orders in early and get the best service the nurserymen can give.

Varieties of Strawberries

The strawberry is generally considered to be the most important of the small fruits, and also to be the most widely adapted of all fruits. The writer has been looking up varieties of strawberries during the past few days, and has not yet found two lists which are identical. Of the numerous lists found, a few varieties are almost always included. This means that those varieties have a wide adaptability, and can generally be relied upon to give good crops. The nursery catalogs—about one hundred in all—in my bookcase make a very interesting study. Some give excellent cultural directions with lists of reliable varieties, and a few new varieties. Others have the most wonderful pictures and descriptions of varieties far better than any variety ever before offered (?). It is that class of berries—these most wonderful—that

the writer wishes to warn the prospective planter from purchasing in large quantities, because at least ninety-nine out of each hundred are not as desirable in general as the standard varieties which have shown their adaptability to various soils. It is an excellent practice to get a dozen plants of such varieties as the planter thinks will suit his conditions and try them out. In this way many growers have been able greatly to increase the yield without much extra labor, by finding a better variety for his farm than what he had.

In selecting strawberries the planter must remember that some varieties when planted alone produce fruit, even in the absence of all other strawberries; these are called *perfect*.

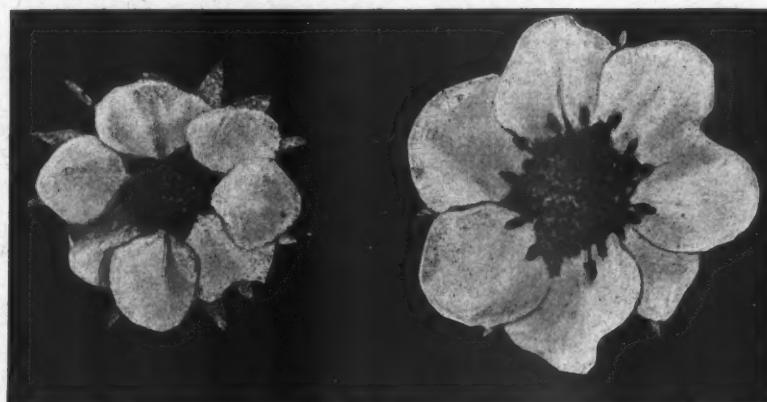
Late varieties—Sample (Imp.), Aroma, Nellie, Gandy (semi-perfect), Rough Rider, and Stevens' Late Champion.

Percentage of Acreage

Mr. George M. Darrow, of the Bureau of Plant Industry, Department of Agriculture, Washington, D. C., in writing in the *Journal of Heredity* stated that the acreage of commercial planting in the South was divided among the varieties as follows:

Klondike	79% of total acreage
Aroma	8% " " "
Missionary	7% " " "
Gandy	2% " " "
Excelsior	2% " " "

In the northern part of the United States the Dunlap ranks as the most popular commercial and home variety. Taking lists from sixty-five



Showing a Perfect Flower, at the Right, and an Imperfect Flower at the Left.
Note the Large Stamens in the Perfect Flower

nurserymen's catalogs from thirty-one different states, the following list shows the varieties arranged according to number of times they were mentioned. For example, Dunlap was mentioned fifty-one times and Clyde sixteen in the sixty-five catalogs:

Dunlap	Klondike
Gandy	Ozark
Haverland	Stevens, L. C.
Bubach	Bederwood
Brandywine	Chesapeake
Aroma	Michel
Warfield	Crescent
Glen Mary	Excelsior
Sample	Parson
Belt (Wm.)	Lady Thompson

These lists give the varieties which have shown a wide adaptability. There is a constant stream of newer varieties being put upon the market, many of which may replace these older varieties, but which must be tested in small quantities before risking the larger planting.

Of the newer varieties, the Chesapeake has made the best showing of the late varieties. It is worthy of trial. Parson, Pride of Michigan, Stevens' Late Champion, Abington, Amanda, Big Joe, Early Jersey, Giant are other new varieties worth trying out.

For the grower who has an extra rich soil and who will feed the plants abundantly, the Marshall will probably be a satisfactory variety for fancy market nearby. The other fellow



The Morris Nursery Company

LET us help you select your ornamental trees, shrubs, fruit trees, small fruits, roses, etc., for your spring planting. We ship to all parts of the United States.

Send now for our free Catalogue. This will give valuable suggestions, planting tables, and spraying calendars.

Box 210

WEST CHESTER, PA.

The Best Strawberry PLANTS are from the Famous Bauer Fields

WE have been in this one business in the same place for 37 years, and we have furnished over 150,000 people with choice strawberry plants. I want to count you as one of my patrons, and therefore I will be glad to send you my big, free catalog. Write for it to-day.

AROMA and KLONDIKE, the two most planted varieties grown in the South and Southwest, can be furnished by the millions.

PROGRESSIVE and SUPERB, EVER-BEARING PLANTS—the two best of the ever-bearing family at prices that are right. By planting these two varieties you will have strawberries six months in the year. 25 plants, postpaid, 60c; 50 plants, postpaid, \$1.00; 100 plants, postpaid, \$1.50. Don't delay. Send for big, free book to-day.

J. A. BAUER

Lock Box 58

Judsonia, Ark.

who knows he will neglect his berries may feel sure he will have strawberries if he plants the Crescent and Michel.

Superb, Progressive and Francis seem to be the best of the everbearing strawberries. See December issue of the AMERICAN FRUIT GROWER.

Varieties of Raspberries

There are three classes of raspberries. One, the black cap raspberry, which propagates by tip layerage; two, the red raspberries, which reproduce by suckers from the roots, and three, the purple-cane raspberry, which is a hybrid, or cross between the other two. The commercial varieties of the latter have generally inherited the habit of reproduction from the black cap parent, although some of the crosses have the habit of the red parent.

Varieties of Black Caps—Kansas, Gregg and Cumberland are the three most generally recommended varieties. Black Diamond and Plum Farmer are rapidly gaining in their popularity.

Varieties of Red Raspberries—King, Herbert and Cuthbert have the popularity almost to themselves at present. St. Regis, or Renere, has been advertised extensively by nurserymen because of its fall bearing habit. Commercial growers have not taken to it very enthusiastically.

Varieties of the Purple-Cane Raspberry—Columbian heads the list with Shaffer, Haymaker and Cardinal close competitors. These are well suited to home plantings because of their heavy production, long season and high quality. The color is not attractive enough for fancy market.

Varieties of Blackberries

Early Harvest, Eldorado, Lawton and Snyder are all frequently mentioned east of the Rocky Mountains. Joy, Blowers and Macatawa are newer introductions which seem to have some merits.

WHEEL HOES A PROFITABLE INVESTMENT

Europe has led the way in intensive agriculture. French and German peasants have long secured marvelous returns from small areas, but at a labor cost that would be prohibitive in this country. It has remained for American inventors and manufacturers to make intensive gardening efficient.

Iron Age garden tools have liberated "the man with the hoe"—taken the kink out of his back, and made him ten times more productive. Instead of bending laboriously over the plants he now pushes his wheel hoe down the long straight rows.

Combination wheel hoes may now be had with attachments for every gardening purpose. There's a style that will meet your need.—Advertisement.



Intensive Gardening the Modern Way.

Varieties of Dewberries

Lucretia, a West Virginia variety, is the most widely grown of all, while the Mayes, or Austin, is generally planted with it to insure pollination.

Varieties of Currants

Red varieties: Perfection, Cherry, Fay, Red Cross and Victoria are all well established. Diploma, a new variety, is showing up well. Of the black varieties, Black Naples and Lee Prolific are generally planted. Of the white varieties, the White Grape and White Imperial are most common.

Varieties of Gooseberries

Of the American species the Downing is the most popular, with Houghton a close second. Carrie, a new variety, is showing up well, and seems worthy of a trial. The European varieties all are so affected with the gooseberry mildew that they can not be relied upon in the eastern states unless frequently sprayed with bordeaux or potassium sulphide. Industry has given the best results, Chautauqua and Crown Bob are other varieties. Oregon Champion, which seems to have some of the European blood, is gaining in popularity. It comes into bearing early, and is prolific. Whether it will continue to resist the mildew the writer does not know.

Varieties of Grapes

The following list of varieties of grapes is suitable for home planting. The names are arranged about in the order of ripening:

Winchell (white)	Barry (black)
Moore's Early (black)	Concord (black)
Campbell Early (black)	Niagara (green)
Delaware (red)	Agawam (red)
Worden (black)	Lindley (red)
Brighton (red)	Catawba (red)

This list will give ripe grapes from August until frost, and then until Christmas if the grapes are stored in a cool cellar and packed in cork.

The Loganberry, which is a cross between the red raspberry and the blackberry or dewberry, has many de-

sirable factors, but will not stand the winters of West Virginia. It may be very desirable farther south. It is a dark red berry as large as the Eldorado blackberry, and thimble

shaped. Good for canning or making juice.

Avoid the Giant Himalaya berry, the Wonder berry and most of the other novelties.

SALESMEN Wanted to sell

Our **West Virginia Grown NURSERY STOCK**. Fine canvassing outfit FREE. Cash Commissions Paid Weekly. Write for terms.

THE GOLD NURSERY CO.
Mason City, W. Va.

Fine Fruit Land For Sale

\$10 per acre will produce bright Tobacco, Cotton, Corn, Forage Crops and Melons. The best land in the State for Peaches, Scuppernongs, Dewberries, and Strawberries.

C. U. HINSHAW
Vass, N. C.

Try It Out! **A New Squash**

GREGORY'S HONEST SEEDS

Symmes Blue Hubbard Squash
Test our latest innovation in the seed world—the Symmes Blue Hubbard Squash. The dryest, sweetest, finest-grained squash we ever knew. Some will weigh 45 lbs. Price 10c. per package, postpaid. Large beautifully illustrated catalog free.

J. J. H. GREGORY & SON
455 Elm Street, Marlboro, Mass.

Fertile Virginia Farms

Along Chesapeake & Ohio Railway

At \$15 an acre and up. Easy terms and quick profits. Mild climate, rich soil, abundant rainfall, plentiful and cheap labor. Convenient to Eastern markets, also to good schools and churches. Write for free illustrated booklet of farm homes just far enough South. Address

K. T. CRAWLEY
Indus. Agt., C. & O. Ry. Room 555
RICHMOND, VA.

Have You Ever Tried Any of the **MUNSON** Varieties of GRAPES?

YOU HAVE MISSED SOMETHING IF YOU HAVE NOT

IRON AGE

Farm, Garden and Orchard Tools
Answer the farmer's big questions: How can I grow crops at least expense? How can I get my spraying done and on time? Use an

IRON AGE Engine Sprayer

No. 115-P Greatest combined field and orchard sprayer

Sprays 10 rows potatoes, 5 rows cantaloupes, cucumbers, etc. at one operation and at 200 pounds pressure. The first and only sprayer adapted for so rapid field work and at the same time, under pressure, for spraying trees, etc. by 412 H.P. NEW WAY ENGINE—quickly interchangeable with any engine. Any engine Digs. We make full line of potato, spraying, garden and garden tools. Write today for free catalog.

Bateman Mfg Co., Box 9H, Glenloch, N.J.

Send to the

MUNSON NURSERIES
Dept. V
DENISON, TEXAS

for their Catalogue describing 40 choice varieties of grapes; also general line of Nursery Stock.

POULTRY

CAROLINA PRODUCE COMPANY

Commission Merchants

OUR SPECIALTIES—Live and Dressed Poultry, Eggs, Veal, Pork, Wool, Dried Fruits, Raw Furs and Game in Season.
1326-28 EAST CARY STREET.

RICHMOND, VIRGINIA

EGGS

APPLES

TO THE TRADE—GREETING

The father of our firm was the first commercial strawberry grower of the Chattanooga district. It was thirty-five years ago that he commenced the growing of strawberries. Both members of the firm have been identified with the growing of the strawberry for more than twenty years.

PRICE LIST OF STRAWBERRY PLANTS

	Per 1,000	Per 1,000
Aroma	\$1.25	\$1.25
Bubach	2.50	2.50
Big Joe	5.00	5.00
Chesapeake	5.00	5.00
Excelsior	1.25	1.25
Early Ozark	2.00	2.00
Evening Star	2.00	2.00
Haverland	3.00	3.00
Lady Thompson	1.25	1.25
Klonide	1.25	1.25
Everbearing	6.00	6.00

Remember! We are the Original Plant Growers of this Section
Palmetto Asparagus. A Southern variety of excellent quality. The best commercial sort of the South. Strong two-year plants, \$3.00 per thousand.
Amoor River Privet. The best all-round ornamental hedge for the South; a perfect evergreen. If interested write for prices.
We can also furnish Raspberry, Blackberry and Dewberry plants of all the leading sorts. Write for prices.

A. HORN & SONS

Route 3, BODDY, TENN. Route 1, HARRISON, TENN.
Agent, H. F. CHASE, Hastings, Florida

Kindly mention American Fruit Grower when writing to Advertisers



Discussion of Tractor Economics

DONALD YERKES, Washington, D. C.

The study of tractor economics in which I have been engaged for the past few years, is part of the work of the Office of Farm Management of the United States Department of Agriculture. It has involved a study of the results obtained with tractors by a large number of farmers. The data so gained are based on actual service conditions which are practically impossible of duplication in a test.

Costs and returns form the principal problem in connection with power farming. In comparing the horse and tractor it is essential that costs and returns for both should be considered. If the returns from the tractor are greater than from the horse, it would not matter if the cost of operation were proportionately higher. On the other hand, if the returns are less, the cost of operation should be correspondingly lower. These two factors are practically inseparable.

Of the three methods of providing tractors for farm work—private ownership, co-operative management, and custom operation—individual ownership is usually more satisfactory than joint ownership. American farmers, as a class, are not well adapted to joint ownership. It has been my observation that joint ownership is more often a failure than a success.

Custom Work

Personally, I do not believe in the practice of a farmer doing custom work with his tractor. If he has time to do custom work it is an indication that his farm is too small to be an efficient unit. It will usually pay him better to buy or rent sufficient additional land to provide work for his tractor during the working seasons; work done on his own crops will usually prove more profitable than custom work for his neighbors. His neighbors expect to make a profit from their crop after paying him for his work. Why should he not raise the crop himself and enjoy this profit? A farmer who is contemplating the purchase of a tractor should not rely on profits from custom work to justify its purchase.

And it seems to me that the practice of some tractor enthusiasts in including fancied profits from custom work in their figures is to be condemned. They seldom, if ever, consider the possible profits from the use of horses for custom work, although they comment frequently on

the fact that the horses are idle a large part of the time; and if idle, then they are available for custom work. The tractor is eventually to be part of the ordinary farm equipment, in which case each farm should have its own tractor, and there would be practically no more opportunity to do custom work with the tractor than with horses at present.

Practically all farm operations must be carried on within a limited season. Between these seasons there will often be no field work which the tractor can do, either on the home farm or on those of neighbors, and the fact that weather and soil conditions are such as to permit field work with a tractor does not mean that there will be work which the tractor can do. Farm management plays an important part in organizing a tractor farm so as to provide employment for the tractor during as many days as possible. Such organization involves the planning of a crop rotation which will furnish a large amount of work which the tractor can do, and which will distribute the work over as wide a period as possible. At the same time the rotation must include only crops which can be grown at a profit in that particular section.

Sufficient Power?

The claim is frequently made that farms do not have sufficient power to carry on their work. This is true, but should be modified by stating that the farms are not properly organized to efficiently utilize their power. The progress of farming methods has not kept pace with the progress in the development of improved farm implements. It has been demonstrated time and again that by a proper re-organization of many farms it is possible to do the work in an entirely satisfactory manner with fewer horses. A great many farmers pay little attention to the arrangement of their crop rotation, and frequently raise two or more crops which demand a large amount of work at the same season.

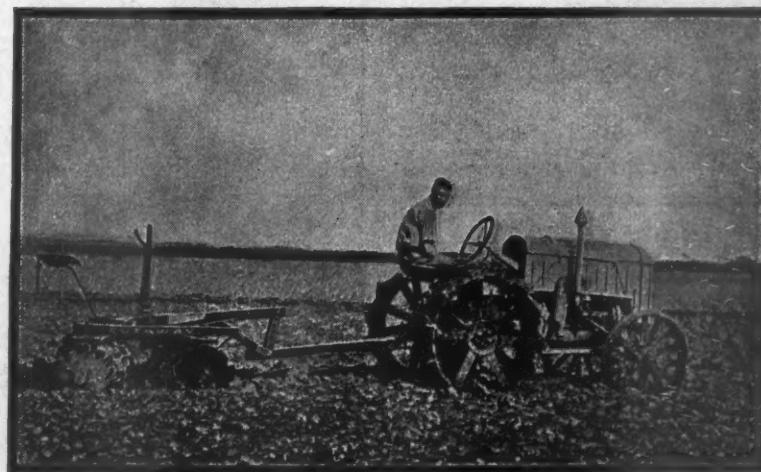
The question of whether a tractor will prove profitable on any given farm must, in most cases, be worked out individually for that particular farm, as figures for no other one will apply.

I consider the two principal advantages of the tractor over the horse for farm work are the fact that it

furnishes a large amount of power which permits of carrying on the farm operations at the proper time, while it also furnishes power for belt work, and thus frequently avoids the expenditure of money in hiring such work done. This is somewhat at variance with the common practice of crediting the tractor with considerable value in increasing the crop yields, but from my observations this is a less important factor than either of those mentioned. As a matter of fact the use of the tractor frequently has no bearing whatever on the crop yield, and has, perhaps, been responsible for as many decreases as increases in yields.

I do not wish to be understood as intimating that the tractor will not increase crop yields, as in many cases it will do so, but such increases are a great deal more likely to result from plowing and preparing the seed bed at the proper time than from more intensive cultivation in the form of deep plowing, subsoiling, etc. These are by no means new, and while ex-

FORD TRACTOR AT FREMONT
One of the most interesting sights of the great Fremont (Nebraska) Tractor Demonstration was the "latest edition" of the "Little Henry" Tractor. While this little tractor is not yet ready to go upon the market it performed nobly at the demonstration.



A Promising Tractor and a Great Harrow

The above illustration shows the "little wonder" pulling the Cutaway Light Tractor Harrow—one of the notable successes of the past season. This double-action engine harrow has 24 18-inch disks, and cuts 6½ feet wide, harrowing the soil twice at a single operation. It is sturdily built and strongly braced. The rigid main frame holds each gang to its work—prevents shifting and sliding. The fore disks throw the soil out, and the rear disks cut just midway between the fore disks, throwing the soil back. Thus every particle of soil is thoroughly stirred and left level.

The Cutaway Light Tractor Harrow has adjustable hitch, and can be adjusted to any engine. "A chain is no stronger than its weakest link," and it is well to remember that high-grade tractor equipment is quite as important as a high-grade tractor. You'll make no mistake in buying a Cutaway. It has cutlery steel disks, forged sharp, oil-soaked hardwood bearings, and is backed by more than half a century's harrow-building experience.—Advertisement.

Kindly mention American Fruit Grower when writing to Advertisers

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Order your spray material now. Direct from factory to farmer. Concentrated LIME-SULPHUR solution, 50-gal. barrel, \$5.00. Special price on carloads.

ARSENATE of LEAD powder, 30% arsenic oxide; 100-lb. keg, 22c per pound. SCALE OIL, 50-gal. barrel, 40c per gallon.

Commercial Flour Sulphur, 99% pure, 2c per pound.

AMCO power sprayer, complete, \$90.00.

ALLEN MANUFACTURING CO.

Quakertown, N. J.

I HAVE NOW MADE IT POSSIBLE
for any worthy, creditable person, anywhere in the U. S. to buy a High Grade WITTE engine on practically his own terms

ED. H. WITTE
Write me stating what size engine and you need and I will mail you latest WITTE prices direct from factory. Write for Free Book "How to Judge Engines"—Ed. H. Witte.

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NO MONEY
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ALL CASH
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3% INTEREST—COMPOUNDED
SEMI-ANNUALLY ON
SAVINGS ACCOUNTS

THIS strong, conservative Bank makes a specialty of mail accounts. Both Savings and Commercial accounts solicited. We also act as Executor and Trustee.

*Capital and Surplus, \$400,000.00
Resources over . . . \$2,000,000.00*

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BANK OF COMMERCE AND TRUSTS
901 E. Main Street RICHMOND, VA.

periments indicate that in some cases crop yields are increased thereby, it seems to be the general experience among farmers that the increased yield is not usually sufficient to offset the increased cost of production.

Future of Tractors

Future tractor development should be conservative, but I believe that it should be progressively so. The tractor can only be developed by being used on farms, and I believe that it should be adopted as rapidly as possible on farms where its use will prove

FOR SALE Pedigreed Apple and Peach Trees for commercial orchards. Ornamental, Shade Trees, Evergreens, and Roses. Agents Wanted. Write for Terms.

E. W. JONES NURSERY CO., Woodlawn, Va.

STRAWBERRY PLANTS that do grow and produce fruit true to name. No finer plants grown that will make money for you. Seed Corn, the largest yielding varieties. Ringlet Barred Rocks. Stock Eggs in season. My Catalogue is FREE. Write to-day.

JOHN W. HALL

Marion Station

Maryland

OLD COINS WANTED

We pay from \$2.00 to \$500.00 EACH for hundreds of old U. S. and Foreign Coins. Keep all money dated before 1895, and send TEN cents at once for a copy of our New Illustrated Coin Value Book, size 4 x 7, showing guaranteed prices we pay for coins. Get posted at once, as it may mean DOLLARS to you. C. F. CLARK & CO., Coin Dealers Box 157, Le Roy, N. Y.

New Ford Joke Book 1917

All the latest jokes on the Ford Auto. Hundreds of them and all good ones. Spring a new one on your neighbors. Large book with colored cover by mail, 10c

NEW ENGLAND PUBLISHING CO.
Box 500 St. Newell, Conn



Buy one of these 5 and 10 Acre LITTLE FARMS IN VALLEY OF VIRGINIA. Specially selected desirable locations, Richland Heights in Shenandoah Valley, 5 and 10 acre tracts, \$250.00 and up, easy terms—good soil, timber, pasture and live stock country. Dependable. Send your name for literature. F. H. LA BAUME, Agr'g'l. N. & W. Ry 116 Acrea Bldg., Roanoke, Va.

Strawberries

Large, Luscious Ones

The kind you can eat from Allen's Plants will mean delicious Berries on your table and money in your pocket. Strawberries will succeed in the garden, in the young orchard, in the field—wherever other crops will grow. Our 1917 Book of Berries tells how. Write today for your copy—FREE.

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Total Resources, 2,000,000

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profitable. The tractor has barely emerged from the experimental stage; in fact, a great many makes have not yet emerged.

One of the most important factors in the future tractor development from a farmer's standpoint, as it has been in the past, will be the price at which tractors can be sold. The large outfits of a few years ago were altogether too expensive to justify their purchase on the average farm, and the prices of many of those now on the market are also too high to make a

really economical investment for the farm. It is more than probable, however, that as the volume of business increases the prices will be reduced. This has occurred in the case of other machines, and there would seem to be no reason why it should not occur with the tractor. The general adoption of the tractor, like that of other machines, is not likely to occur until the prices of tractors reach comparatively low figures. At the same time quality must be first-class. The tractor of poor quality is dear to the

farmer at any price. In speaking of a low-priced tractor I do not mean one of cheap construction. The price is very important to the farmer, but quality is still more important.

If tractors are adopted and the consumption of materials which can be used by the human race for food is reduced to a considerable extent as would certainly appear reasonable to believe would occur, the prices of these materials will decrease, as the supply would be greater in proportion to the demand.



No. 31—What farm implement, machine part or mechanical term does this picture represent?



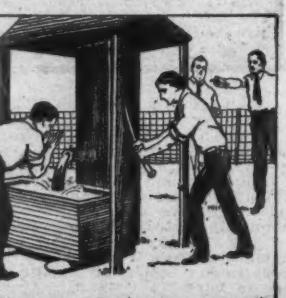
No. 32—What farm implement, machine part or mechanical term does this picture represent?



No. 33—What farm implement, machine part or mechanical term does this picture represent?



No. 34—What farm implement, machine part or mechanical term does this picture represent?



No. 35—What farm implement, machine part or mechanical term does this picture represent?

THINK OF IT, READERS—\$1,000.00 FOR A SET OF SUGGESTIONS!

AND YOU CAN BE THE ONE WHO RECEIVES THE THOUSAND!

\$3,500.00 WILL BE DIVIDED AMONG 400 READERS!

READ EVERY WORD!

THIS Game is simply a series of fifty pictures, each drawn to represent some farm tool, etc. Pictures 31-40 appear on this page and the last installment, pictures 41-50, will appear in the next issue of the AMERICAN FRUIT-GROWER. The first thirty pictures appeared in our October, November, and December issues. If you haven't these copies now, and desire to play the Game, you can obtain all fifty pictures by obtaining the Reprint and Reply Book, as this contains all fifty pictures with spaces for as many as six suggestions for each picture. This book has been prepared and issued to provide a convenient and compact, safe, and economical form for participants who do not desire to go to the trouble of clipping or copying pictures from this publication. What we mean by clipping or copying pictures is explained in the next paragraph.

YOU CAN SUBMIT SUGGESTIONS AT NO COST!

Our readers are invited to submit suggestions for titles to pictures, and 400 awards, totaling \$3,500, will be divided among 400 persons who submit the best sets of suggestions. This can be done in two ways: Either in what is known as the Reprint and Reply Book or in single-picture sets. The Reprint and Reply Book contains the fifty pictures with spaces for as many as six suggestions opposite each. Copy of this book will be sent free to any one using the coupon below. If you do not care to subscribe to receive the Reprint and Reply Book you can clip pictures from the columns of this publication or make pen or pencil reproductions of same, and, using a separate sheet of paper for each picture (clipped or drawn), place one (one only) title suggestion for that picture below it. On each sheet you must put your name and address. Single-picture sets must be sent in flat (not wrapped round) and postage should be affixed at the rate of 2c per ounce. All sets must be filed with Farm and Fireside, Springfield, Ohio, and no sets can be filed before January 20th, and all sets must be in the mail before midnight of February 20th. DO NOT SEND YOUR SETS TO THE AMERICAN FRUIT-GROWER, BUT SEND THEM DIRECT TO FARM AND FIRESIDE, SPRINGFIELD, OHIO.

YOU CAN GET ALL MATERIALS FREE!

The coupon below explains how you can get all materials free if you desire personal and private copies of the Reprint and Reply Book. As you will be allowed to submit as many as five sets of different suggestions you can secure as many copies of the Reply Book as you desire to use, each Reply Book being considered a set. If you desire to submit but one set, it might be well to secure two Reply Books, sending one in to Farm and Fireside and retaining one for your own permanent record.

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Charlottesville, Va.

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R. F. D.
P. O. State

NOTE.—\$1.50, covering two combination subscriptions, will entitle you to two copies of the Reprint and Reply Book. If you desire more than two copies of this book send an additional combination subscription for each additional copy desired. If you desire to submit the maximum number of sets which will be accepted from one participant (5) send \$8.75, which will cover five combination subscriptions. (One of the subscriptions can be your own.) They may be new or renewal. If you send in more than one subscription, or if subscription is that of a friend, send name and address of subscriber or subscribers on a separate sheet of paper.

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No. 36—What farm implement, machine part or mechanical term does this picture represent?



No. 37—What farm implement, machine part or mechanical term does this picture represent?



No. 38—What farm implement, machine part or mechanical term does this picture represent?



No. 39—What farm implement, machine part or mechanical term does this picture represent?



No. 40—What farm implement, machine part or mechanical term does this picture represent?

R. L.
Plum
Steel
ing
Skyline
106 EAS

Lost! 100 Lbs. of Butter!



Yes, you certainly did lose that \$30 worth of butter last year, if you milked ten cows and did not use a Sharples. For no other separator skims clean when you turn it *too slow*—and 19 out of 20 people do turn too slow much of the time. The wonderful new Sharples is the *only* separator that skims clean, regardless of how fast or how slow you turn it, because the "suction-feed" makes the milk feed vary with the operating speed. The

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Will Avoid This Loss

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Nurseryman Good Ground, N. Y.

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